Fisheries and Oceans Canada | Pêches et Océans Canada
Science | Sciences

C S A S | **S C C S**

Canadian Science Advisory Secretariat | **Secrétariat canadien de consultation scientifique**

Research Document 2002/130 | **Document de recherche 2002/130**

Not to be cited without permission of the authors * | Ne pas citer sans autorisation des auteurs *

A review of Pacific cod *(Gadus macrocephalus)* monitoring surveys in Hecate Strait, March – July 2002

Examen des relevés de surveillance de la morue du Pacifique (*Gadus macrocephalus*) dans le détroit d'Hécate (mars à juillet 2002)

A. Sinclair
G. Workman

Fisheries and Oceans Canada
Science Branch, Pacific Region
Pacific Biological Station
Nanaimo, BC. V9T 6N7

* This series documents the scientific basis for the evaluation of fisheries resources in Canada. As such, it addresses the issues of the day in the time frames required and the documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

Research documents are produced in the official language in which they are provided to the Secretariat.

This document is available on the Internet at:

* La présente série documente les bases scientifiques des évaluations des ressources halieutiques du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

Les documents de recherche sont publiés dans la langue officielle utilisée dans le manuscrit envoyé au Secrétariat.

Ce document est disponible sur l'Internet à:

http://www.dfo-mpo.gc.ca/csas/

ISSN 1480-4883
© Her Majesty the Queen in Right of Canada, 2002
© Sa majesté la Reine, Chef du Canada, 2002

Canada

Abstract

A stratified random bottom trawl survey has been designed and implemented to monitor changes in the abundance of Pacific cod in the Hecate Strait area in collaboration between the Canadian Groundfish Research and Conservation Society (CGRCS) and Fisheries and Oceans Canada (DFO). The survey focuses on areas of known Pacific cod distribution and consists of 5 monthly sampling trips between March and July. The first full set of surveys was conducted in 2002. The initial results are encouraging. The survey met expectations for variance of the population index with a coefficient of variation of 20%. If this can be met in future surveys, there is a good chance the survey will detect changes in population abundance of a magnitude necessary for management. The size frequency data collected were consistent with previous observations of the stock. Juvenile fish were found primarily on the Shell Ground area where they had been reported in the past. Adult fish were found in the other main areas. This suggests that it should be possible to monitor the movement of relatively strong year-classes through the population as they recruit.

Résumé

La Société canadienne pour la conservation et la recherche sur les poissons de fond et Pêches et Océans Canada ont collaboré à la conception et à la réalisation d'un relevé aléatoire stratifié au chalut de fond dans le but de suivre l'abondance de la morue du Pacifique dans le détroit d'Hécate. Ce relevé porte principalement sur les zones où la morue du Pacifique a déjà été observée et consiste en cinq sorties d'échantillonnage mensuelles effectuées entre mars et juillet. La première série complète de relevés a été réalisée en 2002 et les résultats initiaux sont encourageants. Le relevé a répondu aux attentes en matière de variance de l'indice d'abondance de la population avec un coefficient de variation de 20%. Si les relevés futurs donnent des résultats semblables, il est fort probable qu'ils permettront de détecter des changements d'abondance d'une ampleur suffisante pour gérer le stock. Les données recueillies sur les fréquences de taille concordent avec les observations antérieures faites sur le stock. Les juvéniles ont été observés principalement dans la zone *Shell Ground*, où ils avaient été répertoriés dans le passé, tandis que la présence des adultes a été constatée dans les autres principales zones. Cela suggère qu'il serait possible de suivre les déplacements des classes d'âges relativement abondantes au sein de la population au fil de leur recrutement.

Introduction

Pacific cod in area 5CD (Hecate Strait) are caught mainly in the multispecies groundfish trawl fishery. The fishery is regulated by single species total allowable catches (TAC) for the component species. The TAC for the Pacific cod in this area was reduced considerably for the 2001/02 fishing year because of low assessed stock size. The assessment was based largely on abundance indices derived from commercial fishing catch per unit effort (CPUE). With the reduced TAC, fishers avoided areas of high cod abundance in order to maintain quota holdings for cod while fishing for other species. This biased the CPUE data and reduced its utility in tracking changes in stock abundance (Sinclair et al., 2001). A multispecies trawl survey is conducted biennially in Hecate Strait. However, the relatively low sample size in this survey coupled with the distribution of Pacific cod results in a high estimation variance and limited value in tracking changes in abundance (Sinclair, 1999).

Recognizing this shortfall in the traditional abundance indices, the PSARC Groundfish Subcommittee recommended "the implementation of a multiyear monitoring program in Hecate St. beginning in 2002 to replace the loss of abundance indices derived from fishery data" (Stocker and Cass, 2001). This work was undertaken in collaboration between the Canadian Groundfish Research and Conservation Society (CGRCS) and Fisheries and Oceans Canada (DFO). This document describes the design of the monitoring program and the results of the first year of operation.

Methods

General Considerations

Bottom trawl survey methodology was chosen to develop an abundance index for the monitoring program. This was because almost all commercial Pacific cod catches are made in trawl fisheries, there is enough background data on the characteristics of trawl catches to plan a survey, and the survey methodology is relatively well known. Alternative approaches such as tagging and hydroacoustic surveys were considered but ruled out. Pacific cod have been successfully tagged in the past, however these studies have focused on migration and growth rather than abundance estimation. Furthermore, there needs to be a directed fishery to achieve adequate recoveries to be successful as an abundance estimate. This condition does not exist. Hydroacoustic methodologies for Pacific cod do not currently exist and their development would require a dedicated research program. The requirement for this stock is to have a monitoring program in place immediately and there was not enough time to develop a hydroacoustic approach.

At the outset it was recognized that a bottom trawl survey based monitoring program should follow the following principles. The survey should have a scientifically accepted design which will detect changes in relative abundance of a magnitude relevant to the stock condition. Sampling should focus on fishing grounds where Pacific cod are traditionally found in order to increase efficiency. Historical commercial fisheries data from these grounds were used to estimate the variance of CPUE and the number of

fishing sets required to achieve a target precision. It was recognized that the survey would be required for a number of years in order to detect changes in abundance. It was necessary to standardize the fishing gear and vessel.

Survey design

A stratified random survey design was chosen. Stratification was used as a method to distribute sampling effort rather than increase sampling efficiency. However, such efficiencies may be gained if initial results indicate large differences in variance among strata. Knowledgeable fishermen who had fished Pacific cod in Hecate Strait were consulted to determine prime cod fishing grounds to include as strata in the survey. We were also advised to fish during daylight hours and to focus sampling during periods of strong tides as this was the preferred time of the month to fish cod. These designated areas were verified against historical CPUE data from logbooks (1994-1995) and observer data (1996 – 2001). Five fishing grounds were selected; Two Peaks /Butterworth (TPB), White Rocks (WR), Shell Ground (SG), Horseshoe (HS) and Reef Island (RI) (Fig. 1). Unique sampling locations within each area were then located on a 0.01 degree latitude by 0.01 degree longitude grid using Groundfish trawl observer data. Each location represented the midpoint of at least one commercial trawl set since 1996. A total of 930 potential sites were identified (Fig. 1). Sampling effort was allocated amongst strata in approximate proportion to the number of unique sampling sites. Sites were selected randomly from each stratum using the "Random Sample" function in SPLUS to select a random sub-sample without replacement.

The target sample size was determined based on the observed variation in annual commercial CPUE data from the selected sampling areas and the predicted change in stock size from the most recent assessment. The variability of the commercial CPUE data was examined with a multiplicative model which included year, month, and area as main effects. The standard deviation of the residuals from this model was 1.64 and the number of null sets was approximately 15%. The most recent stock assessment for this stock predicted that the stock biomass would increase by 37% between 2002 and 2003 if the catch in 2002 was 200 t (the current TAC). Sampling theory indicates that a sample size of about 180 tows would distinguish differences of plus 37% 19 times out of 20. Consequently, a target sample size of 180 observations was used for the survey.

Two options for conducting the survey were considered; one annual survey with 180 tows and a number of smaller monthly surveys. The latter was chosen for operational considerations. It was recognized that a commercial vessel would have to be chartered to do the survey since DFO research vessel time was already booked. It was considered less disruptive to the fishing operations of the charter vessel to conduct a number of monthly surveys rather than one large survey that would take several weeks to complete. It was also noted that Pacific cod CPUE was favorable during the period March to July. As a result, it was decided to conduct monthly surveys in these months with a target of 36 survey tows. An additional 4 tows were allocated at the discretion of the vessel skipper to allow simulation of commercial operations.

Vessel

An agreement was reached between DFO and the CGRCS to undertake the monitoring survey in Hecate Strait. The CGRCS provided funding for the vessel while DFO paid for onboard science personnel, data processing and data analysis. A request for proposals was released to industry to identify interested vessels. Proposals were reviewed and the successful candidate vessel was determined on the basis of vessel suitability (length, sampling area, accommodations), fishing master experience (years fishing in Hecate Strait, Pacific cod landings) and cost.

The F/V Caledonian, a 30.6 meter steel stern trawler with an 850 horsepower engine was chartered to conduct the surveys. The net used was an Atlantic western IIA bottom trawl (Fig. 2) rigged with 45.7 cm (18") bobbins in the bosom and 45.7 cm (18") half eggs up the wings. The net was fished off 22 mm (7/8") main warp with a set of Thyboron 107 trawl doors. The head rope was 22.7 m (74' 6") and the foot rope was 32.4 m (106'4"). The wings and body of the net were constructed of 12.7 cm (5") and 11.4 cm (4.5") polypropylene web. The codend was built of 15 cm (6") web and was equipped with a 50 mm (2") mesh codend liner for all sets during the surveys. Sweeps and bridles were 73.1 m (240') in length. The vertical opening of the net was 5.5 m (18'), the wingtip spread was estimated to be 13.8 m (45') and the door spread was estimated at approximately 70 m (~228'). Set locations were determined using a Furuno GPS and trawl tracks were plotted using either MAPTECH or NOBELTEC software.

Fishing operations

The DFO scientific authority predetermined thirty-six of the 40 set locations to be completed during each of the surveys. The remaining 4 set locations were determined by the vessel captain. A list of fishing locations was provided for each of the surveys with the 36 "primary" and 16 "alternate" sites. The primary sites were to be used first and if for one reason or another (including tear up) the captain deemed a particular location un-fishable then an alternate site was to be used. There was a slight departure from this survey design for the first survey in March 2002 during which all sites were predetermined by DFO. For all predetermined set locations the tow had to pass within 0.5 km of the designated set location. The direction and actual tow track for each set was determined by the captain. Tow tracks were recorded on a separate set of nautical charts (CHS 3802 and 3902) for each of the surveys. Sets were numbered consecutively from 1 on each trip with the original location number also recorded. If a set was made and significant gear damage occurred, the set was numbered according to it's sequence and a gear damage code entered on the set sheet. The tow duration was to be 20-30 minutes at a tow speed of 2.9 – 3.0 knots for all survey sets and fishing for survey purposes was to be carried out between 06:00 and 18:00 hrs daily. Instructions for one survey are included in Annex 1.

Catch sampling

All catches less than approximately 750 kg were completely sorted (Whole Haul Sort) by species to the lowest taxonomic level possible and the catch weight for each species recorded. For catches greater than approximately 750 kg a random sub-sample of 5 – 9 baskets (200 – 400 kg) was sorted to determine the species composition of the catch. For larger more conspicuous animals such as Pacific cod, halibut, lingcod and skate individual weights were estimated or measured and recorded for the entire catch irrespective of whether the catch was sub-sampled. Catch weights were measured using either a MAREL 2200 motion compensated digital scale or a hand held spring scale. All Pacific cod were sampled for length, sex, and maturity. If the Pacific cod catch was large a sub-sample of 200 fish was to be selected at random for this purpose.

All data were recorded on standard fishery observer forms and delivered to Archipelago Marine Research (AMR) at the end of each trip for keypunching, verification and delivery to DFO.

Index

The index of relative abundance computed from the survey data is the stratified mean catch per unit effort weighted by the number of trawlable locations in each stratum.

These formulae apply for a single survey (i.e. month)

Observations

C_{sh} catch weight (kg) in set s in stratum h

D_{sh} duration (hr) of set s in stratum h

f_{lsh} number of fish measured at length l in set s in stratum h

N number of possible set locations in survey area

N_h number of possible set locations in stratum h

n_h number of fishing sets made in stratum h

Calculated values

$U_{sh} = \frac{C_{sh}}{D_{sh}}$ Catch per unit effort in set s in stratum h: units $kg \cdot hr^{-1}$

$w_h = \frac{N_h}{N \cdot n_h}$ Weight assigned to all sets in stratum h for calculating stratified means.

$\overline{U}_h = \frac{\sum_s U_{sh}}{n_h}$ Mean catch per unit effort in stratum h

$Var_{\overline{U}_h}$ Variance of the mean catch per unit effort in stratum h

$$\overline{U} = \sum_h \left(w_h \cdot \sum_s U_{sh} \right)$$

Stratified mean catch per unit effort in the survey: units $kg \cdot hr^{-1}$

$$Var_{\overline{U}} = \frac{1}{N^2} \sum_h \frac{N_h^2 \cdot Var_{\overline{U}_h}}{n_h}$$

Variance of the stratified mean catch per unit effort

$$S_{sh} = \sum_l f_{lsh} \cdot 7.377E-06 \cdot l^{3.0963}$$

Calculated sample weight for set s in stratum h: units, l in cm, S in kg. Length/weight relationship from Westrheim, 1996. Sample weight was only calculated for sets where there was subsampling, otherwise $S_{sh} = C_{sh}$

$$F_{lsh} = \frac{C_{sh} \cdot f_{lsh}}{S_{sh} \cdot D_{sh}}$$

Catch per unit effort of length l fish in set s in stratum h, adjusted for subsampling: units $\#\cdot hr^{-1}$

$$\overline{F}_l = \sum_h \left(w_h \cdot \sum_s F_{lsh} \right)$$

Catch per unit effort of length l fish caught in the survey: units $\#\cdot hr^{-1}$

$$\overline{F} = \sum_l \overline{F}_l$$

Stratified mean catch per unit effort in the survey: units $\#\cdot hr^{-1}$

The annual index was calculated as the stratified mean including fishing ground and month as strata. Bootstrapping was used to estimate the distribution of monthly and annual survey indices. The bootstrap procedure involved generating pseudo-samples by random resampling of the original survey results, with replacement, by stratum and month to obtain pseudo sample sizes equal to the original sample sizes. The stratified and annual means were calculated for each pseudo sample. The procedure was run 1000 times. The annual length frequency was estimated by summing the monthly length frequencies at length and dividing by 5, the number of monthly surveys.

Results

Aggregate catch by species across all surveys is presented in Table 1. Total catch weight by species is presented separately for both survey and skipper sets as well as totaled. The most abundant 7 species accounted for 145,392 kg or 78% of the aggregate catch of 184,754 kg. These species were: Arrowtooth flounder (*Atheresthes stomias*), 59,799 kg (32%); English sole (*Pleuronectes vetulus*) 17,061 kg (9%); Rex sole (*Errex zachirus*) 15,903 kg (9%); Pacific cod (*Gadus macrocephalus*) 15,007 kg (8%); Spotted ratfish (*Hydrolagus colliei*) 14,615 kg (8%); Dover sole (*Microstomus pacificus*) 12,921 kg and Big Skate (*Raja binoculata*) 10,086 kg (5%). For set locations selected by the skipper these 7 species accounted for 92% of the catch with just two species, Arrowtooth flounder and Pacific cod accounting for 81%. The most prevalent (most often caught) species was English sole being caught in 91% of all sets, followed by Spotted ratfish (90%), Arrowtooth flounder (84%), Pacific cod (80%), Pacific halibut (*Hippoglossus stenolepis*) (74%), Rex sole (70%) and Rock sole (57%). In all, 122 taxa of fish and 61 taxa of invertebrates were identified over the course of the 5 surveys. Several species were abundant and prevalent, i.e. Arrowtooth flounder was present in 84% of sets and

accounted for 32% of the total catch weight. In contrast, many minor species were prevalent but not abundant, i.e. Petrale sole was present in 45% of sets but accounted for 0% of the catch weight and Sturgeon poacher was present in 38% of sets and represented 0% of the catch weight.

The number of sets, both survey and skipper's, are summarized by fishing ground and month in Table 2. The first survey took place between March 20th and 24th , 2002. A total of 40 sets were completed all of which were predetermined by the scientific authority. Set by set tow data (location, depth and timing) are presented in Annex 2. A total of 16,950 kg of mixed groundfish were caught of which 460 kg (N=225) was Pacific cod. Species catch weights by set are presented in Annex 3. Set locations for this survey are plotted in Fig. 3. Sized symbols show that cod were caught primarily on Two Peaks/Butterworth (260 kg, N=150, mean wt = 1.73 kg) and White Rocks (162 kg, N= 44, mean wt = 3.68 kg).

The second survey was conducted between April 24th and 28th, 2002. Forty sets were completed of which 36 were predetermined survey sets while 4 sets were at the skipper's discretion. The total catch from survey sets was 27,997 kg of mixed groundfish of which 1,088 kg (N= 1199) was Pacific cod. Skipper sets resulted in a total catch of 2,379 kg of which 519 kg (N= 1199) was Pacific cod. Set locations are plotted in Fig. 4. Most of the cod catch by weight came from Two Peaks/Butterworth area (597 kg, N = 487, Mean wt = 1.23 kg) while the largest catch in numbers came from the Shell Ground (186 kg, N=622, Mean wt. = 0.30 kg).

The third survey was completed between May 22nd and May 25th, 2002. Forty-one sets were completed of which 36 were usable survey sets, one was a snag and 4 were skipper sets. During this survey 37,518 kg of mixed groundfish were caught during survey sets of which 3,225 kg (N=3106) was Pacific cod. Skipper sets resulted in a total catch of 9,816 kg of which 2,103 kg (N=1085) was Pacific cod. Set locations are plotted in Fig. 5. The bulk of the catch came from Two Peaks/Butterworth (2776 kg, N=1220, Mean wt = 2.28 kg).

Survey four took place between June 15th and June 18th, 2002. Forty sets were completed, 36 survey sets and four skipper sets. The total catch for this survey was 34,458 kg of which 2,507 kg (N=1858) was Pacific cod. Skipper sets resulted in a total catch of 22,458 kg of which 2,491 kg (N=1342) was Pacific cod. Similar to the April and May surveys cod fishing was most productive at Two Peaks/Butterworth (1748 kg, N= 641, Mean wt = 2.73 kg, Fig. 6).

The final survey for this year took place between July 17th and 20th, 2002. Again forty sets were completed, 36 survey and 4 skipper. A total of 26,981 kg were caught during survey sets of which 1,924 kg (N=1120) was Pacific cod; 5,516 kg were caught during skipper sets of which 682 kg (N=1412) was Pacific cod (Fig. 7).

The principle survey index of stratified mean CPUE (kg/hr) is presented in Table 3. The average CPUE was highest in the Two Peaks/Butterworth area in each month, and the

highest CPUE in this area was recorded in May. CPUE was also high in the SG area in April – June, but low in March and July. The White Rocks area ranked third in average CPUE with the highest average in July. CPUE was low in areas Reef Island and Horseshoe in all months. The monthly stratified mean CPUE increased from March – May, then declined in June and July. This likely reflects movement of Pacific cod into and out of the survey area. The coefficient of variation on the stratified mean CPUE ranged from 0.23 in March, when catches were small, to 0.46 in May, when the largest catches were achieved. This may reflect the contagious distribution of Pacific cod where an increase in abundance is seen in a few larger catches rather than a uniform increase in the catches from all sets. The annual survey index was 103.7 kg · hr^{-1} with a standard deviation of 20.8 giving a coefficient of variation of 20%. The distributions of the monthly and annual mean CPUE were slightly skewed but not overly so (Fig. 8). The means and standard deviations of the bootstrap estimates were similar to the stratified means and standard deviations indicating little bias in the estimators.

The mean CPUE of the skipper selected sets were between 3 and 9 times higher than the randomly selected stations (Table 4).

In most cases the entire catch was measured but for a few tows sub-sampling was required: set 17 in April, sets 21, 31, 32, 34, 35, and 37 in May, sets 23, 24, 33, 35, and 36 in June and sets 27 and 40 in July. Sex and maturity state were also determined for all measured fish. Out of a total catch of 10,548 codfish, 6,450 were measured.

Length frequency histograms by fishing ground and survey are presented in Fig. 9. The vast majority of the catch in numbers came from the Shell Ground and Two Peaks/Butterworth areas. Small cod (modal length 28-30 cm) dominated the catches on the Shell Ground and these are likely to be 1-year-old fish based on size at age data in Westrhiem (1996, Table 5.5.9). Two size classes were present at Two Peaks/Butterworth with modes at 48 – 50 cm and 59 – 64 cm. These modes do not correspond as well to Westrheim's (1996) lengths at age for two and three year old Pacific cod, which ranged from 42.8 – 47.1 cm and 54.6 - 60.1 cm depending on latitude with fish in the south (Strait of Georgia) growing faster than those in the North (Hecate Strait). The modes at Two Peaks/Butterworth may represent two and three year old fish but would indicate very rapid growth and unusually large size at age. Conversely these modes might represent 3 and 4 year old fish which were growing slowly, Westrhiem (1996) presented lengths at age for 3 and 4 year old Pacific Cod of 54.6 – 60.1 and 63.7 – 68.9. Also evident from the length frequency plots is the preponderance of larger fish comprising several year classes on the White Rocks ground. Reef Island grounds appear to be occupied primarily by one year old fish while the Horseshoe appears to have both one and two year olds present. In Fig. 10 length frequency histograms are presented by sex. There appear to be no large differences in size composition between the sexes for cod in Hecate Strait beyond the presence of a few larger female codfish. Length frequency data by set and sex is presented in Annex 4-7. Fig. 11 shows the mean weighted CPUE in numbers per hour at size across all surveys for 2002. Modes are evident at 28 – 30, 50, 60 – 64, and 75 cm.

Discussion

A new field program to monitor changes in the abundance of Pacific cod in the Hecate Strait area has been designed and implemented. The main component of the program is a stratified random bottom trawl survey designed to provide a relative index of population size. The plan is to sample the population monthly between March and July. The first full set of surveys was conducted in 2002. The initial results are encouraging. The survey met expectations for variance of the population index with a coefficient of variation of 20%. If this can be met in future surveys, there is a good chance the survey will detect changes in population abundance of a magnitude necessary for management. The size frequency data collected were consistent with previous observations of the stock. Juvenile fish were found primarily on the Shell Ground area where they had been reported in the past. Adult fish were found in the other main areas. This suggests that it should be possible to monitor the movement of relatively strong year-classes through the population as they recruit.

While the survey has promising qualities, there is a need to consider how the results may be used to inform management decisions. The survey provides an index of relative population size, not an estimate of absolute population size. It will be important to consider trends in the index and not an estimate in any single year. Consequently, it will take at least 3 years before one can confidently say whether there has been a change in stock status. The current TAC was established to promote an increase is stock size and the TAC would be increased when positive signs of recovery have been seen. It will also be important to consider, in advance, how much of an increase in the index would be required before implementing a change in TAC. On the other hand, the index may decline in future years. If this is the case, more stringent management measures may be needed.

Several other commercially important species were taken in the initial survey. While the design focused on areas of known cod distribution, it may be possible that a useful index may be found for other species.

Recommendations

1) Continue the current survey design for as long as needed. It is important to maintain the monthly survey structure to ensure comparability from year to year.

2) Initiate discussions on management decision rules that would stem from both increases and decreases in the survey index.

3) Investigate the utility of the survey for indexing abundance of other species.

Acknowledgements

We are grateful for comments provided by P. Starr, M. Saunders, and K. Rutherford. R. Kronlund helped with some flashy S-Plus graphics.

References

Sinclair, A.F. (1999) Survey design considerations for Pacific cod in Hecate Strait. Canadian Stock Assessment Secretariat Research Document **99/196**: 42p.

Sinclair, A.F., Martell, S. and Boutillier, J. (2001) Assessment of Pacific Cod off the West Coast of Vancouver Island and in Hecate Strait, Nov. 2001. Canadian Stock Assessment Secretariat Research Document **2001/159**.

Stocker, M. and Cass, A. (2001) Report of the PSARC Groundfish Subcommittee meeting, November 13-16, 2001. Canadian Stock Assessment Proceedings Series **2001/034**.

Westrheim, S.J. (1996) On the Pacific cod (Gadus macrocephalus) in British Columbia waters, and a comparison with Pacific cod elsewhere, and Atlantic cod (G. morhua). Can. Tech. Rept. Fish. Aqua. Sci. **2092**: 390 p..

Table 1: Total catch in kg by species by type of set for all surveys combined. Survey sets were pre-determined by the DFO scientific authority while the survey vessel captain selected the skipper sets. N indicates the number of positive catches for the species.

Common Name	Latin name	Survey Sets				Skipper sets				Total			
		Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N
Cod fishes													
Pacific cod	*Gadus macrocephalus*	9212	6%	144	78%	5795	14%	15	94%	15007	8%	159	80%
Pacific tomcod	*Microgadus proximus*	2160	1%	103	56%	49	0%	5	31%	2210	1%	108	54%
Walleye pollock	*Theragra chalcogramma*	768	1%	68	37%	4	0%	5	31%	771	0%	73	37%
Pacific hake	*Merluccius productus*	1	0%	2	1%		0%		0%	1	0%	2	1%
Total Codfishes		12140	8%			5848	15%			17988	10%		
Flatfish													
Arrowtooth flounder	*Atheresthes stomias*	33018	23%	153	83%	26781	67%	15	94%	59799	32%	168	84%
Rex sole	*Errex zachirus*	15661	11%	132	72%	242	1%	8	50%	15903	9%	140	70%
English sole	*Pleuronectes vetulus*	15649	11%	168	91%	1412	4%	14	88%	17061	9%	182	91%
Dover sole	*Microstomus pacificus*	12836	9%	98	53%	85	0%	8	50%	12921	7%	106	53%
Rock sole	*Pleuronectes bilineatus*	7423	5%	107	58%	208	1%	7	44%	7631	4%	114	57%
Sand sole	*Psettichthys melanostictus*	3828	3%	73	40%	41	0%	5	31%	3870	2%	78	39%
Pacific halibut	*Hippoglossus stenolepis*	3502	2%	136	74%	926	2%	12	75%	4428	2%	148	74%
Flathead sole	*Hippoglossoides elassodon*	3367	2%	85	46%	98	0%	3	19%	3464	2%	88	44%
Pacific sanddab	*Citharichthys sordidus*	2100	1%	48	26%	11	0%	6	38%	2111	1%	54	27%
Lefteye flounders	*Bothidae (family)*	803	1%	22	12%		0%		0%	803	0%	22	11%
Starry flounder	*Platichthys stellatus*	698	0%	19	10%	11	0%	2	13%	710	0%	21	11%
Butter sole	*Pleuronectes isolepis*	670	0%	31	17%	33	0%	2	13%	703	0%	33	17%
Petrale sole	*Eopsetta jordani*	584	0%	83	45%	35	0%	7	44%	620	0%	90	45%
Slender sole	*Eopsetta exilis*	134	0%	32	17%	5	0%	1	6%	139	0%	33	17%
Speckled sanddab	*Citharichthys stigmaeus*	107	0%	6	3%		0%		0%	107	0%	6	3%
Curlfin sole	*Pleuronichthys decurrens*	74	0%	38	21%		0%		0%	74	0%	38	19%
C-O sole	*Pleuronichthys coenosus*	3	0%	7	4%		0%		0%	3	0%	7	4%
Total Flatfish		100459	69%			29889	74%			130348	71%		

Common Name	*Latin name*	Survey Sets				Skipper sets				Total			
		Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N
Rockfish													
Silvergray rockfish	*Sebastes brevispinis*	1770	1%	20	11%	2	0%	1	6%	1772	1%	21	11%
Yellowtail rockfish	*Sebastes flavidus*	1366	1%	32	17%	5	0%	1	6%	1371	1%	33	17%
Bocaccio	*Sebastes paucispinis*	245	0%	22	12%	133	0%	7	44%	378	0%	29	15%
Pacific ocean perch	*Sebastes alutus*	206	0%	19	10%	1	0%	1	6%	207	0%	20	10%
Quillback rockfish	*Sebastes maliger*	97	0%	20	11%	6	0%	3	19%	103	0%	23	12%
Canary rockfish	*Sebastes pinniger*	78	0%	22	12%	110	0%	2	13%	188	0%	24	12%
Copper rockfish	*Sebastes caurinus*	67	0%	11	6%	2	0%	1	6%	69	0%	12	6%
Black rockfish	*Sebastes melanops*	20	0%	5	3%		0%		0%	20	0%	5	3%
Redstripe rockfish	*Sebastes proriger*	12	0%	6	3%	2	0%	1	6%	14	0%	7	4%
Redbanded rockfish	*Sebastes babcocki*	6	0%	2	1%		0%		0%	6	0%	2	1%
Greenstriped rockfish	*Sebastes elongatus*	2	0%	4	2%		0%		0%	2	0%	4	2%
Darkblotched rockfish	*Sebastes crameri*	0.5	0%	1	1%	1	0%	1	6%	2	0%	2	1%
Sharpchin rockfish	*Sebastes zacentrus*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Widow rockfish	*Sebastes entomelas*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Yelloweye rockfish	*Sebastes ruberrimus*		0%		0%	5	0%	1	6%	5	0%	1	1%
Total Rockfish		3869	3%			267	1%			4137	2%		
Elasmonbranchs													
Spotted ratfish	*Hydrolagus colliei*	14365	10%	166	90%	250	1%	14	88%	14615	8%	180	90%
Big skate	*Raja binoculata*	7634	5%	94	51%	2451	6%	13	81%	10086	5%	107	54%
Spiny dogfish	*Squalus acanthias*	2537	2%	96	52%	57	0%	7	44%	2594	1%	103	52%
Longnose skate	*Raja rhina*	119	0%	15	8%	0	0%	1	6%	119	0%	16	8%
Sandpaper skate	*Bathyraja interrupta*		0%		0%	3	0%	2	13%	3	0%	2	1%
Total Elasmobranchs		24656	17%			2761	7%			27417	15%		
Pelagic fishes													
Pacific herring	*Clupea pallasi*	61	0%	58	32%	5	0%	8	50%	67	0%	66	33%
Shiner perch	*Cymatogaster aggregata*	39	0%	36	20%	1	0%	2	13%	40	0%	38	19%
Chinook salmon	*Oncorhynchus tshawytscha*	29	0%	6	3%		0%		0%	29	0%	6	3%

Common Name	*Latin name*	Survey Sets				Skipper sets				Total			
		Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N
Chum salmon	*Oncorhynchus keta*	24	0%	3	2%		0%		0%	24	0%	3	2%
Eulachon	*Thaleichthys pacificus*	15	0%	18	10%	0.5	0%	1	6%	15	0%	19	10%
Sand lances	*Ammodytidae (family)*	12	0%	18	10%	1	0%	1	6%	13	0%	19	10%
Coho salmon	*Oncorhynchus kisutch*	7	0%	2	1%		0%		0%	7	0%	2	1%
American shad	*Alosa sapidissima*	1	0%	2	1%		0%		0%	1	0%	2	1%
Smelts	*Osmeridae (family)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Viperfish	*Chauliodontidae (family)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Pacific sand lance	*Ammodytes hexapterus*		0%		0%	0.5	0%	1	6%	0.5	0%	1	1%
Total Pelagics		188	0%			9	0%			196	0%		
Demersal fishes													
Lingcod	*Ophiodon elongatus*	1577	1%	89	48%	1363	3%	14	88%	2940	2%	103	52%
Sablefish	*Anoplopoma fimbria*	352	0%	58	32%	4	0%	1	6%	356	0%	59	30%
Pacific staghorn sculpin	*Leptocottus armatus*	86	0%	10	5%	1	0%	1	6%	87	0%	11	6%
Sturgeon poacher	*Podathecus acipenserinus*	71	0%	70	38%	2	0%	5	31%	74	0%	75	38%
Greenlings	*Hexagrammidae (family)*	26	0%	8	4%		0%		0%	26	0%	8	4%
Wolf eel	*Anarrhichthys ocellatus*	21	0%	4	2%	4	0%	1	6%	25	0%	5	3%
Kelp greenling	*Hexagrammos decagrammus*	16	0%	3	2%	0.5	0%	1	6%	17	0%	4	2%
Poachers	*Agonidae (family)*	16	0%	25	14%		0%		0%	16	0%	25	13%
Buffalo sculpin	*Enophrys bison*	13	0%	7	4%	1	0%	1	6%	14	0%	8	4%
Sculpins	*Cottidae (family)*	8	0%	15	8%		0%		0%	8	0%	15	8%
Cabezon	*Scorpaenichthys marmoratus*	8	0%	1	1%		0%		0%	8	0%	1	1%
Prowfish	*Zaprora silenus*	5	0%	2	1%		0%		0%	5	0%	2	1%
Northern sculpin	*Icelinus borealis*	4	0%	9	5%		0%		0%	4	0%	9	5%
Bigfin eelpout	*Lycodes cortezianus*	3	0%	6	3%	0.5	0%	1	6%	3	0%	7	4%
Pacific sandfish	*Trichodon trichodon*	3	0%	6	3%	0.5	0%	1	6%	3	0%	7	4%
Threadfin sculpin	*Icelinus filamentosus*	3	0%	6	3%		0%		0%	3	0%	6	3%
Eelpouts	*Zoarcidae (family)*	2	0%	4	2%		0%		0%	2	0%	4	2%
Great sculpin	*Myoxocephalus polyacanthocephalus*	1	0%	3	2%		0%		0%	1	0%	3	2%
Blackbelly eelpout	*Lycodes pacificus*	1	0%	2	1%		0%		0%	1	0%	2	1%
Northern ronquil	*Ronquilus jordani*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%

Common Name	*Latin name*	Survey Sets				Skipper sets				Total			
		Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N
Red irish lord	*Hemilepidotus hemilepidotus*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Ronquils	*Bathymasteridae (family)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Roughspine sculpin	*Triglops macellus*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Snake prickleback	*Lumpenus sagitta*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Twoline eelpout	*Bothrocara brunneum*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Total Demersals		2220	2%			1376	3%			3595	2%		
Invertebrates													
Jellyfish	*Scyphozoa (class)*	640	0%	38	21%	3	0%	2	13%	643	0%	40	20%
Giant pink star	*Pisaster brevispinis*	145	0%	46	25%	2	0%	2	13%	147	0%	48	24%
Sunflower star	*Picopodia helianthoides*	71	0%	40	22%	8	0%	4	25%	79	0%	44	22%
Sea cucumbers	*Holothuroidea (class)*	49	0%	16	9%	0.5	0%	1	6%	49	0%	17	9%
Sea anemones	*Actiniaria (order)*	33	0%	15	8%		0%		0%	33	0%	15	8%
Corals and sea anemones	*Anthozoa (class)*	24	0%	6	3%	0.5	0%	1	6%	24	0%	7	4%
Sea stars	*Asteriodea (subclass)*	23	0%	16	9%		0%		0%	23	0%	16	8%
Opal squid	*Loligo opalescens*	9	0%	16	9%	1	0%	2	13%	10	0%	18	9%
Vermillion star	*Mediaster aequalis*	6	0%	9	5%		0%		0%	6	0%	9	5%
Scallops	*Pectinidae (family)*	4	0%	8	4%	0.5	0%	1	6%	5	0%	9	5%
Sea urchins	*Echinacea (superorder)*	4	0%	8	4%		0%		0%	4	0%	8	4%
Basket Stars	*Ophiuroidea (class)*	3	0%	7	4%		0%		0%	3	0%	7	4%
Squid	*Teuthoidea (order)*	3	0%	7	4%		0%		0%	3	0%	7	4%
Humpback shrimp	*Pandalus hypsinotus*	2	0%	5	3%		0%		0%	2	0%	5	3%
Pink scallop	*Chlamys rubida*	2	0%	3	2%	0.5	0%	1	6%	3	0%	4	2%
Spiny scallop	*Chlamys hastata*	2	0%	5	3%		0%		0%	2	0%	5	3%
Spiny scallop	*Chlamys hastata hericа*	2	0%	4	2%	0.5	0%	1	6%	2	0%	5	3%
Brown box crab	*Lopholithodes foraminatus*	2	0%	1	1%		0%		0%	2	0%	1	1%
Sea pens	*Pennatulacea (order)*	2	0%	4	2%		0%		0%	2	0%	4	2%
Brittle stars	*Ophiurae (order)*	1	0%	3	2%	1	0%	2	13%	2	0%	5	3%
Dungeness crab	*Cancer magister*	1	0%	2	1%		0%		0%	1	0%	2	1%
Hermit crabs	*Paguridae (family)*	1	0%	3	2%		0%		0%	1	0%	3	2%
Orange sea pen	*Ptilosarcus gurneyi*	1	0%	3	2%		0%		0%	1	0%	3	2%

Common Name	*Latin name*	Survey Sets				Skipper sets				Total			
		Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N	Wt (kg)	% Catch	N	% N
Red squid	*Berryteuthis magister*	1	0%	1	1%		0%		0%	1	0%	1	1%
Rose star	*Crossaster papposus*	1	0%	3	2%		0%		0%	1	0%	3	2%
Sea slugs	*Nudibranchiata (suborder)*	1	0%	3	2%		0%		0%	1	0%	3	2%
Sea whip	*Osteocella septentrionalis*	1	0%	3	2%		0%		0%	1	0%	3	2%
Smooth pink shrimp	*Pandalus jordani*	1	0%	3	2%		0%		0%	1	0%	3	2%
Sponges	*Phylum porifera*	1	0%	2	1%		0%		0%	1	0%	2	1%
Basket stars	*Euryalae (order)*	1	0%	2	1%		0%		0%	1	0%	2	1%
Blood star	*Henericia leviuscula annectens*	1	0%	2	1%		0%		0%	1	0%	2	1%
Cookie star	*Ceramaster patagonicus*	1	0%	2	1%		0%		0%	1	0%	2	1%
Echinoderms	*Phylum echinodermata*	1	0%	2	1%		0%		0%	1	0%	2	1%
Long-armed sea star	*Orthasterias koehleri*	1	0%	2	1%		0%		0%	1	0%	2	1%
Sand star	*Luidia foliolata*	1	0%	1	1%		0%		0%	1	0%	1	1%
Sidestripe shrimp	*Pandalopsis dispar*	1	0%	2	1%		0%		0%	1	0%	2	1%
Weathervane scallop	*Pateinopecten caurinus*	1	0%	2	1%		0%		0%	1	0%	2	1%
Nudibranch	*Arminidae (family)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Sea star	*Luidiaster dawsoni*	0.5	0%	1	1%	0.5	0%	1	6%	1	0%	2	1%
Sea star	*Solaster paxillatus*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Anemone	*Tealia spp*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Bath sponges	*Demospongiae (class)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Bentnosed clam	*Macoma nasuta*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Box crabs	*Lopholithodes spp*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Cushion star	*Pteraster tesselatus*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Fish-eating star	*Stylasterias forreri*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Northern crangon	*Crangon alaskensis*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Oregontriton	*Fusitriton oregonensis*	0.5	0%	1	1%	0.5	0%	1	6%	1	0%	2	1%
Polychaete worms	*Polychaeta (class)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Prawn	*Pandalus platycerous*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Shrimp	*Nantantia (order)*	0.5	0%	1	1%		0%		0%	0.5	0%	1	1%
Total Invertebrates		1053				19				1072			
Grand Total		144585				40169				184754			

Table 2: Distribution of useable fishing stations amongst fishing grounds for each of the Cod monitoring surveys undertaken between March and July 2002. The number of potential stations is listed for each of the fishing grounds. For the March survey 40 sites were pre-selected by DFO, subsequent surveys had 36 pre-selected sites with 4 sites selected by the vessel master. Numbers in brackets represent sets made at the vessel masters discretion.

Fishing Ground	Stations	March	April	May	June	July
Two Peaks/Butterworth	291	11	11 (3)	11 (3)	11 (4)	11 (2)
White Rocks	302	11	11 (1)	11 (1)	11	11
Shell Grounds	138	8	5	5	5	5 (1)
Reef Island	13	2	2	2	2	2
Horseshoe	186	8	7	7	7	7 (1)

Table 3: Mean CPUE and standard deviations by month and strata, monthly stratified mean, standard deviation, coefficient of variation, mean bootstrap estimate and standard deviation of the bootstrap estimates for the 2002 Hecate Strait Pacific cod monitoring survey.

Month	Area	Mean CPUE ($kg \cdot hr^{-1}$)	St. Dev	Monthly Mean	Monthly St. Dev.	CV	Mean Bootstrap	St. Dev Bootstrap
March	HS	7.4	20.8	25.1	5.9	0.24	25.0	5.7
March	RI	0.0	0.0					
March	SG	1.7	2.6					
March	TPB	45.6	45.6					
March	WR	27.9	38.3					
April	HS	3.8	5.5	61.5	23.0	0.37	61.1	21.0
April	RI	10.4	14.7					
April	SG	74.2	111.0					
April	TPB	105.8	209.3					
April	WR	50.9	92.9					
May	HS	1.7	2.1	182.3	84.6	0.46	183.1	79.6
May	RI	5.4	7.7					
May	SG	65.9	64.5					
May	TPB	501.3	892.0					
May	WR	47.1	75.5					
June	HS	58.2	121.1	143.4	65.6	0.46	145.5	63.1
June	RI	3.6	2.6					
June	SG	146.9	218.1					
June	TPB	316.6	668.9					
June	WR	33.3	55.1					
July	HS	16.9	31.6	111.1	33.4	0.30	111.3	32.5
July	RI	17.7	25.0					
July	SG	0.7	0.8					
July	TPB	255.3	310.0					
July	WR	84.4	162.0					

Table 4: Mean, min, max and standard deviation of un-weighted CPUE by month in the 2002 Pacific cod monitoring survey in Hecate Strait. These values include only sets selected by the skipper. Total, min, max, and mean catches are also presented. CPUE is in Kilograms per hour, Catch is in Kg.

Month	Sets (N)	Mean CPUE	STD CPUE	Min CPUE	Max CPUE	Total Catch	Min Catch	Max Catch	Mean Catch
4	4	257	165	73	435	519	43	217	86
5	4	1018	1442	12	3088	2103	5	1595	526
6	4	1265	1283	102	2401	2491	51	1176	623
7	4	341	496	0	1053	682	0	526	171

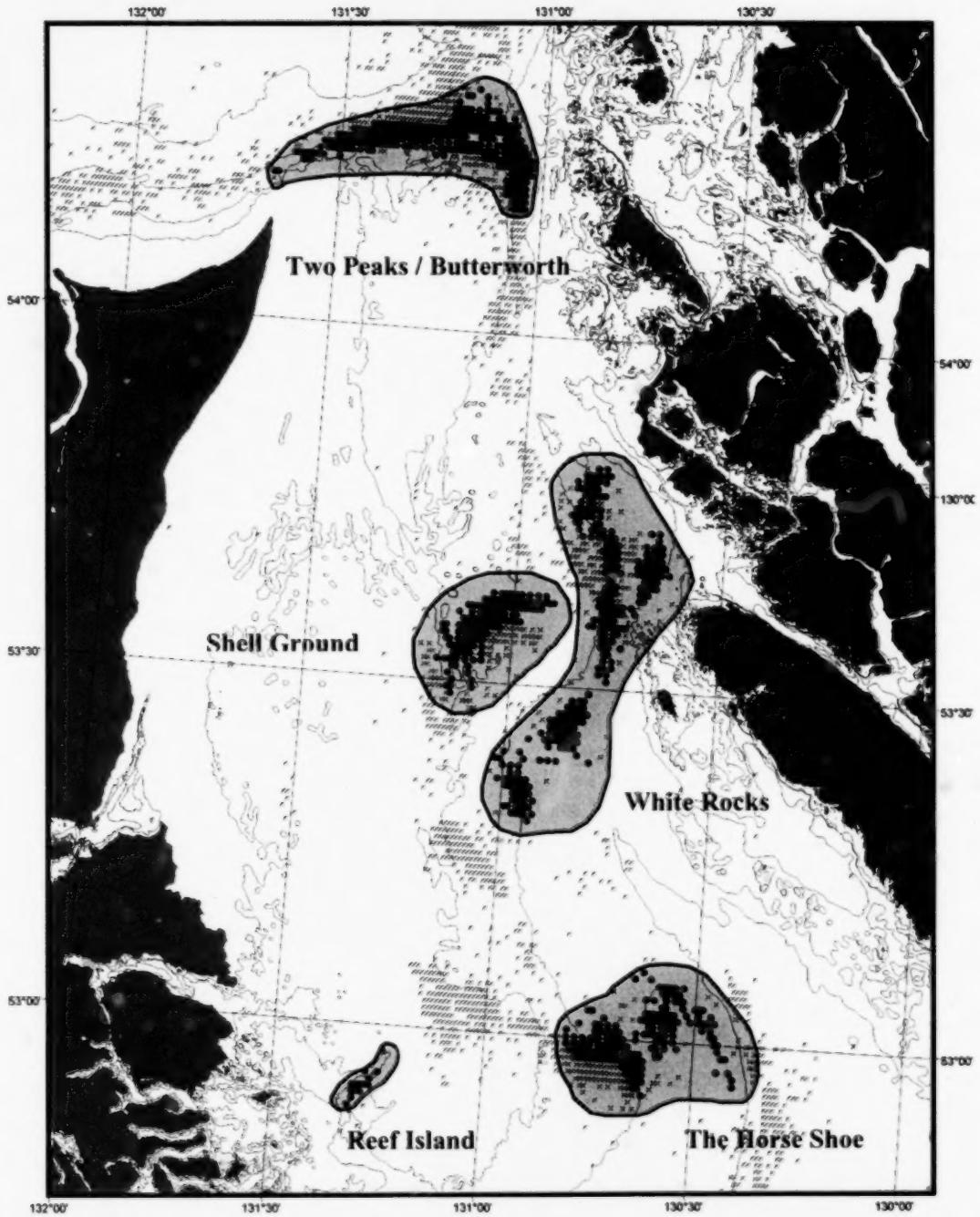

Figure 1: Potential set location in Hecate Strait (x's) and locations selected as Pacific Cod Monitoring stations (red circles)

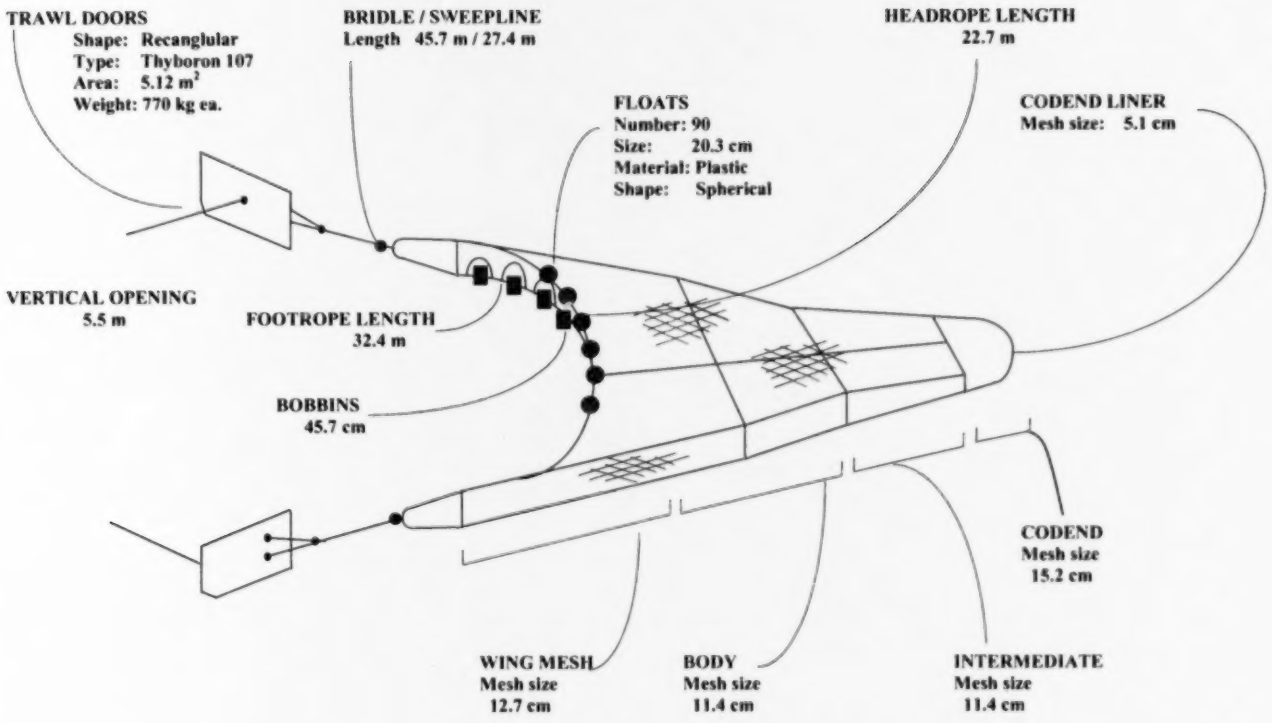

Figure 2: Caledonian Atlantic Western IIA as used during the 2002 Pacific Cod Monitoring surveys in Hecate Strait.

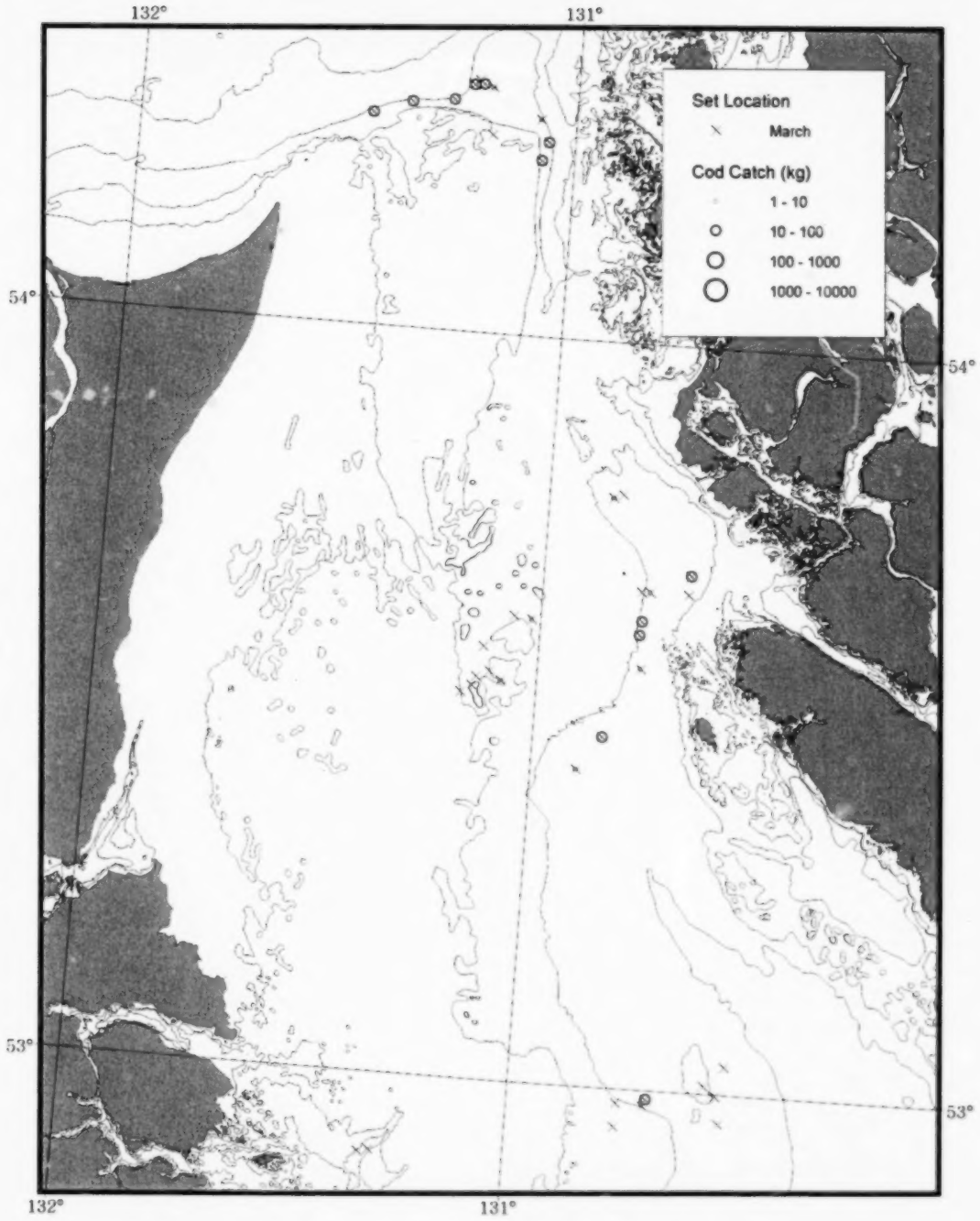

Figure 3: Set location for the March, 2002 Pacific Cod Monitoring Survey, X's represent midpoints of set locations and circle symbols are scaled to the catch of Pacific Cod.

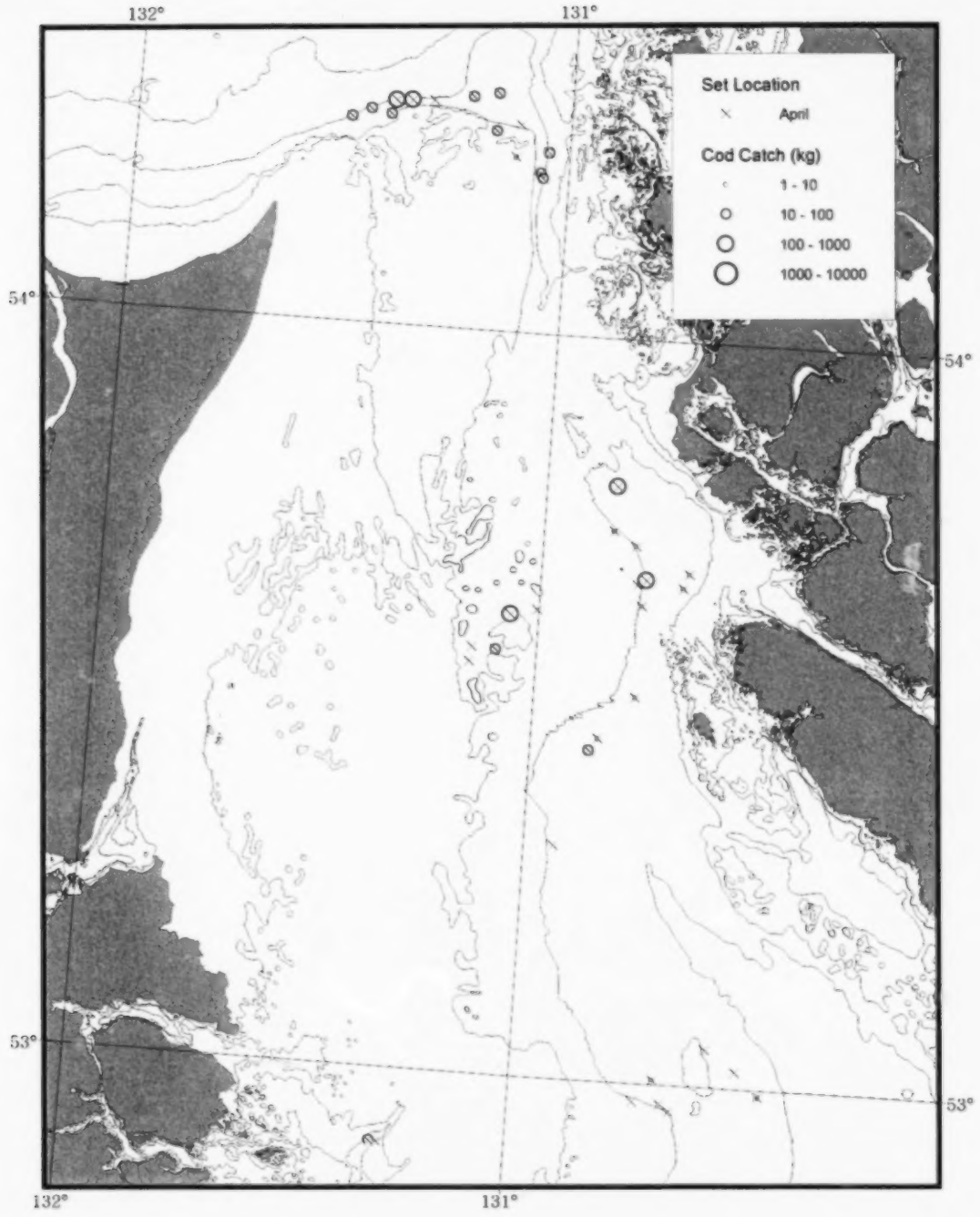

Figure 4: Set location for the April, 2002 Pacific Cod Monitoring Survey, X's represent midpoints of set locations and circle symbols are scaled to the catch of Pacific Cod.

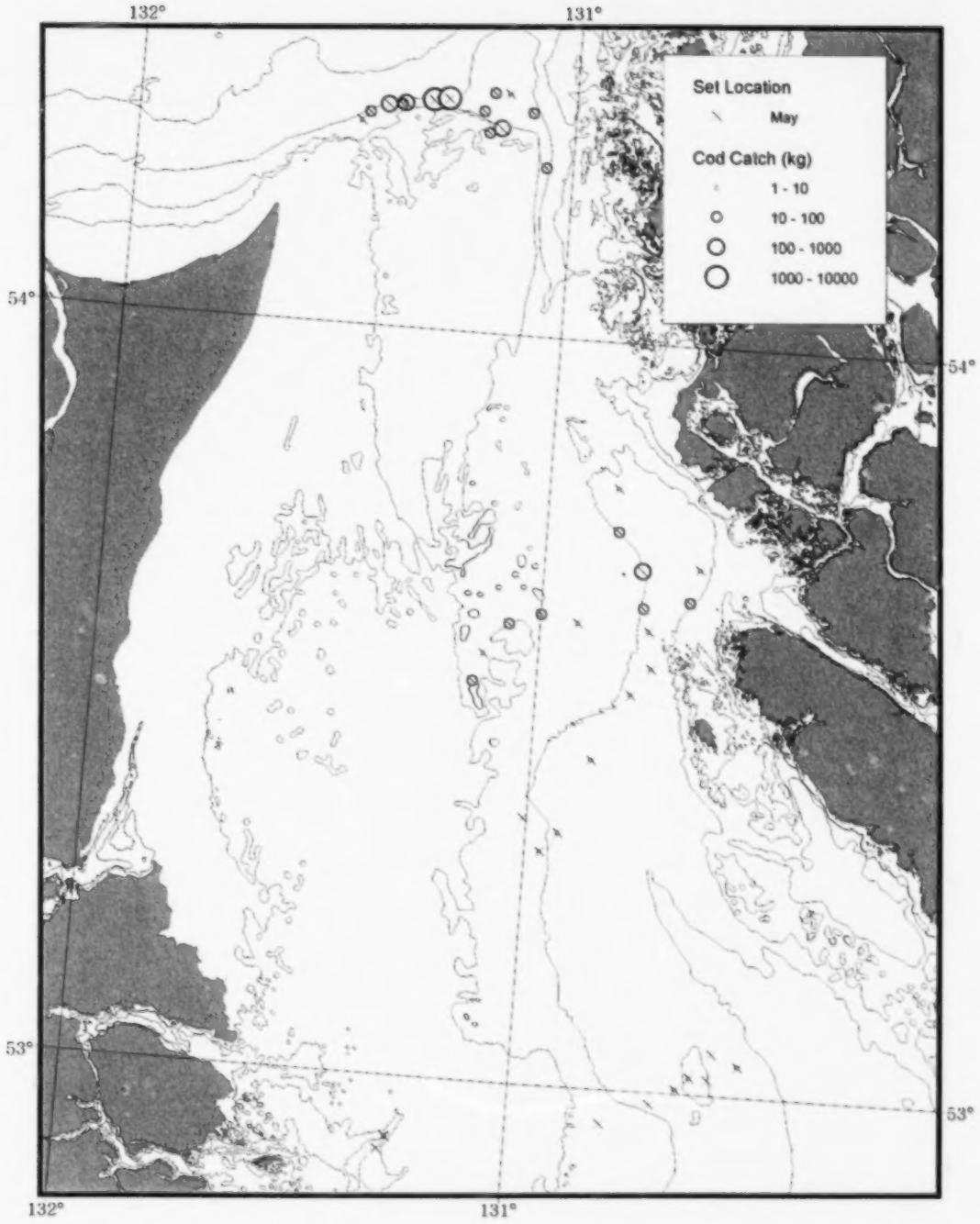

Figure 5: Set location for the May, 2002 Pacific Cod Monitoring Survey, X's represent midpoints of set locations and circle symbols are scaled to the catch of Pacific Cod.

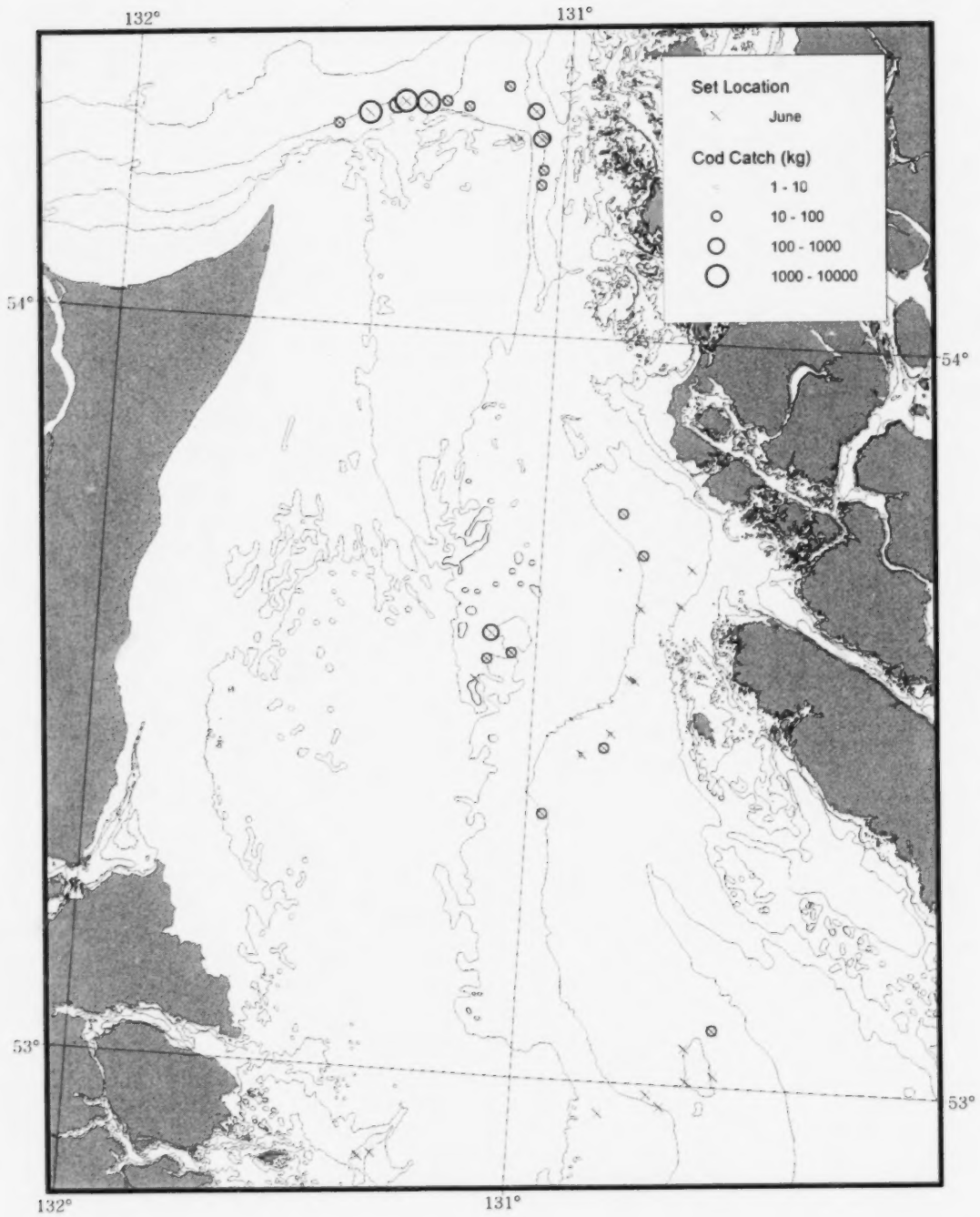

Figure 6: Set location for the June, 2002 Pacific Cod Monitoring Survey, X's represent midpoints of set locations and circle symbols are scaled to the catch of Pacific Cod.

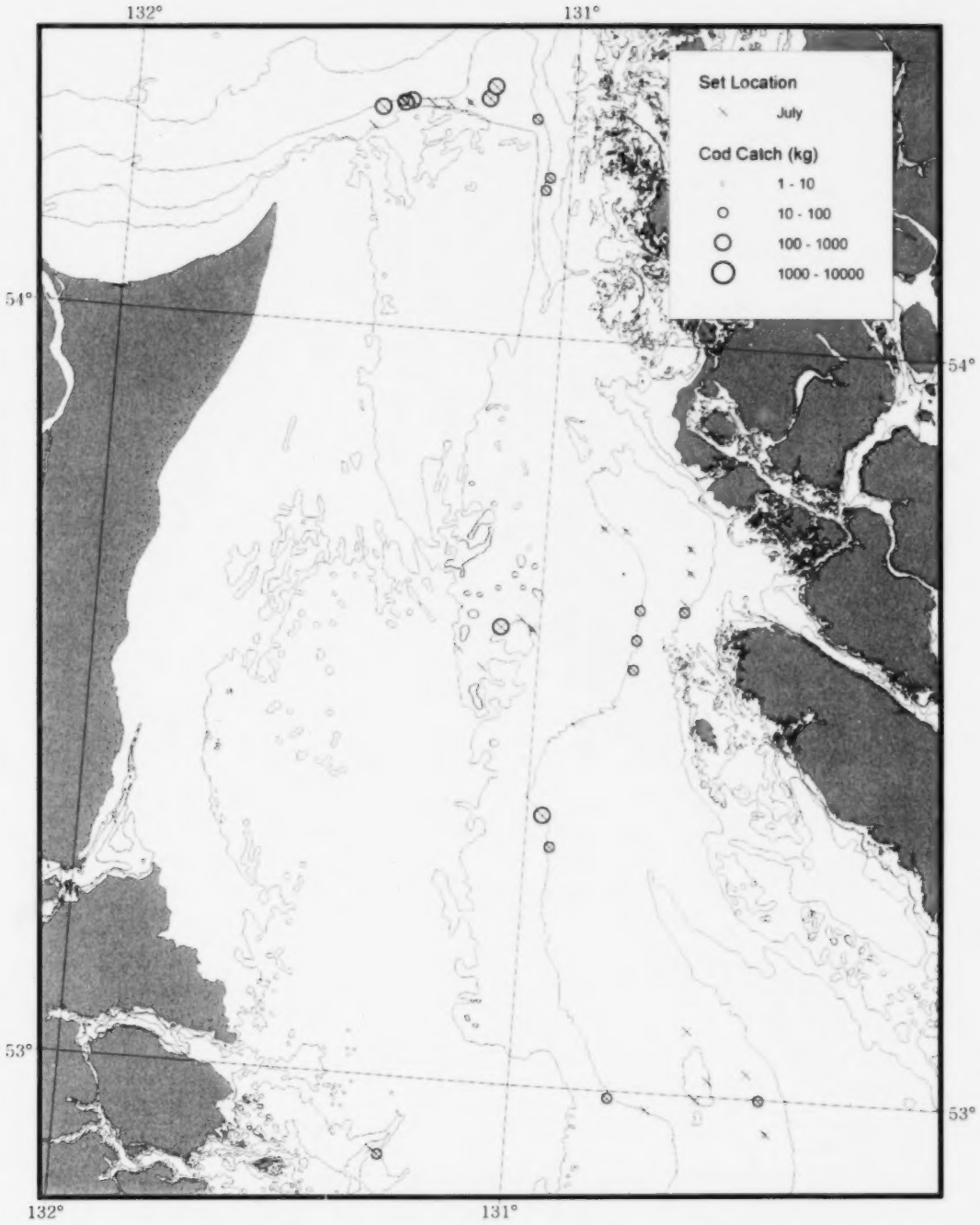

Figure 7: Set location for the July, 2002 Pacific Cod Monitoring Survey, X's represent midpoints of set locations and circle symbols are scaled to the catch of Pacific Cod.

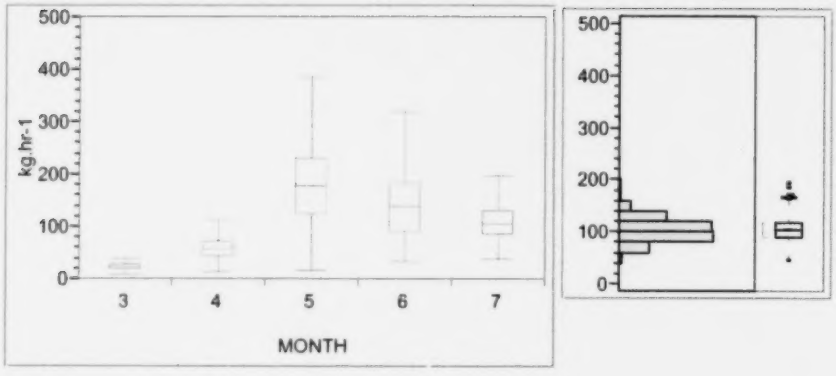

Figure 8: Distribution of monthly (left) and annual (right) bootstrap estimates of mean CPUE (kg·hr-1) of Pacific cod in the 2002 Hecate Strait monitoring survey.

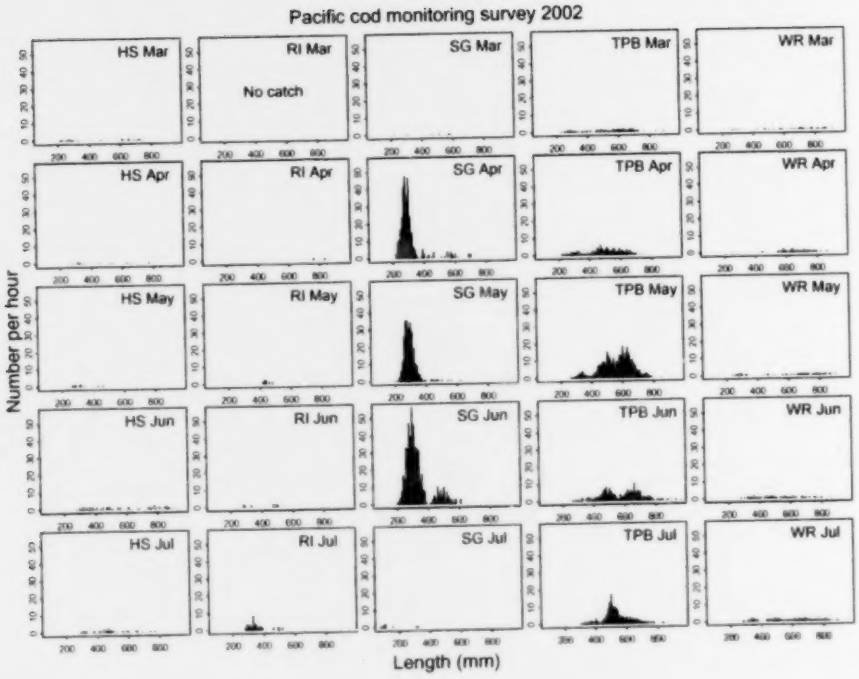

Figure 9: Length frequency histogram for Pacific Cod by fishing ground and survey (month). Abbreviations for fishing grounds are HS, Horseshoe; RI, Reef Island; SG, Shell Ground; TPB, Two Peaks/Butterworth; WR, White Rocks. Fork Length is in cm and the height of each bar represents the proportion of the catch that occurred in each 1 cm size class.

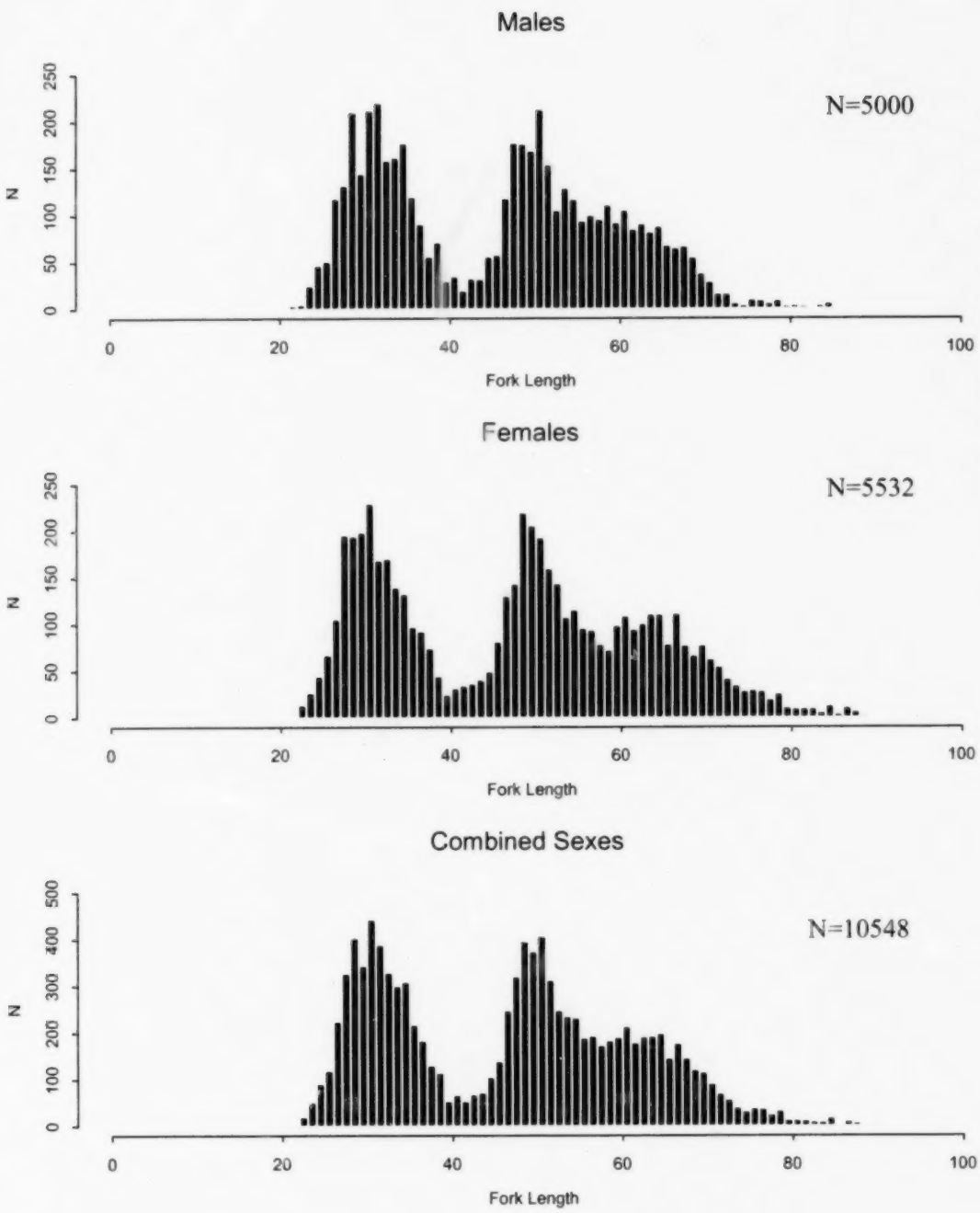

Figure 10: Length frequency plots by sex. Length frequencies have been corrected to total catch for sub-sampled tows. Bar height is the number of cod fish caught in each 1 cm size class across all surveys.

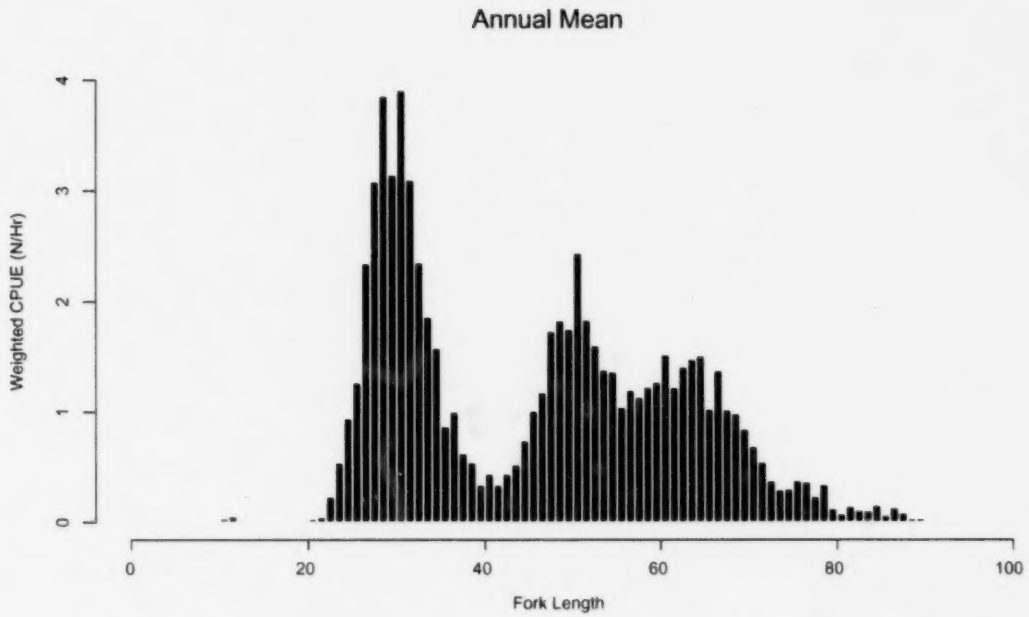

Figure 11: Annual stratified mean length frequency in Numbers per Hour for combined Pacific Cod Monitoring surveys in Hecate Strait, March – July, 2002.

Annex 1:
Hecate Strait Pacific Cod Monitoring Survey
April, 2002

Introduction

With significantly reduced harvest levels and expanded time and area closures for Pacific Cod fishing in Hecate Strait, limited commercial fishery data is available to monitor and assess changes in Pacific Cod recruitment, abundance and growth. Therefore it is important to conduct fishery independent monitoring for this area and species as soon as possible.

The Canadian Groundfish Research and Conservation Society (CGRCS), in collaboration with the Pacific Biological Station, Department of Fisheries & Oceans (DFO), has chartered the F.V. Caledonian to conduct monitoring surveys during the months of March, April, May, June and July for the period 2002 - 2004.

Survey Plan

- Each survey trip is designed to make approximately 40 tows at various locations within Hecate Strait (combined trip total of 200 tows annually).
- 36 of the set locations will be predetermined by the DFO scientific authority, Alan Sinclair (tel: 250-756-7205 office, 250-668-0166 cell, 250-756-4569 home), and will be based on selected areas which have produced good Pacific Cod catches in past years (See attached chart).
- 4 of the set locations will be determined at the discretion of the vessel skipper
- A standard otter trawl with a 50 mm liner will be used on all trips. It is very important that the same net be used throughout the survey. A "hard bottom" Western IIA trawl will be used as it will catch less small flatfish while having good catches of cod, and there will be fewer tear-ups.
- Tow duration will be 20-30 minutes at 2.9 – 3.0 knots.
- For the pre-determined set locations, the tow must pass within 0.5 km of the designated set location. The direction and actual tow line will be determined by the fishing captain. The captain will draw tow lines on nautical charts 3802 and 3902, and return these at the end of the trip. DFO will supply clean charts for each trip. The captain will also return a diskette with tow tracks from Novotech and Truechart track plotters of each set.
- A list of pre-determined fishing locations by area is attached. The "primary" locations should be used first. If a particular location is deemed un-fishable by the fishing captain, or if the set is made and there is damage to the gear that would affect the catch results, then an "alternate" set location is to be selected from the list for that area.
- Fishing for survey purposes will be carried out between 06:00 and 18:00 hrs daily.
- The catch weights of all fish species in each haul will be determined and recorded.
- All catches of Pacific cod will be sampled for length, sex, and maturity. If the catch is large, a subsample of 200 fish will be selected at random for this purpose.
- All data will be recorded on standard fishery observer forms and delivered to AMR at the end of each trip.

- Sets are to be numbered consecutively from 1 on each trip. If a set is made and significant gear damage occurs, the set is to be numbered according to it's sequence and a gear damage code entered on the set sheet.
- Include the original station number from the set location sheet in the set comments.

Conditions of Charter

It is a condition of this charter that the Charter Vessel shall provide meals and accommodations for two (2) observers/scientific personnel selected by the CGRCS and DFO to carry out data collection and sampling requirements on board the Charter Vessel. It is required that the Charter Vessel crew assist the research personnel with all data collection and sampling during the charter. Fish taken onboard from the research sets are likely to be cut open to determine sex and gonad maturity. Some of the samples may be retained for further sampling on shore. Minimal freezing capacity will be required. The survey fish, after sampling, will still be of commercial use and the vessel crew are expected to handle, dress and store the fish in a manner that ensures the highest possible landed value. All proceeds from fish harvested during the charter will be used to pay for the charter. If the proceeds exceed the costs of the charter, surplus proceeds shall be relinquished to the CGRCS.

The Charter Vessel will provide a net (one of the following: Dantrawl, Ingiltrawl, or modified Yankee #1), cod end liner, doors, bridles for the net and a pair of suitable main warp cables from the vessel. The Charter Vessel must maintain the condition and quality of the net, warps, doors and gear. Furthermore, the Charter Vessel agrees to allow for independent inspection of the net, warps, doors and gear to assure that they continue to meet the required specifications. In the event of damage to the net, it shall be restored to its original dimensions (this means that every damaged mesh must be mended to the same standards as the undamaged mesh). The Charter Vessel will also provide plotting software and a computer to record the locations and to map the tracks of each tow made within the charter annually. The CGRCS requires that the length of the warp and the weight of the doors be measured accurately prior to the beginning of the survey.

The primary purpose of the survey is to execute the Pacific Cod tows according to the specified protocol identified by the Scientific Authority. Unless the survey is conducted according to the specified protocol, the information gathered will not achieve the objectives of the survey and the charter may be cancelled at any time if it is thought that these objectives were being compromised.

The vessel must provide a level suitable working area for separating the catch by species, weighing the individual sample catches, and measuring sampled fish. A covered workspace is not mandatory, but is desirable.

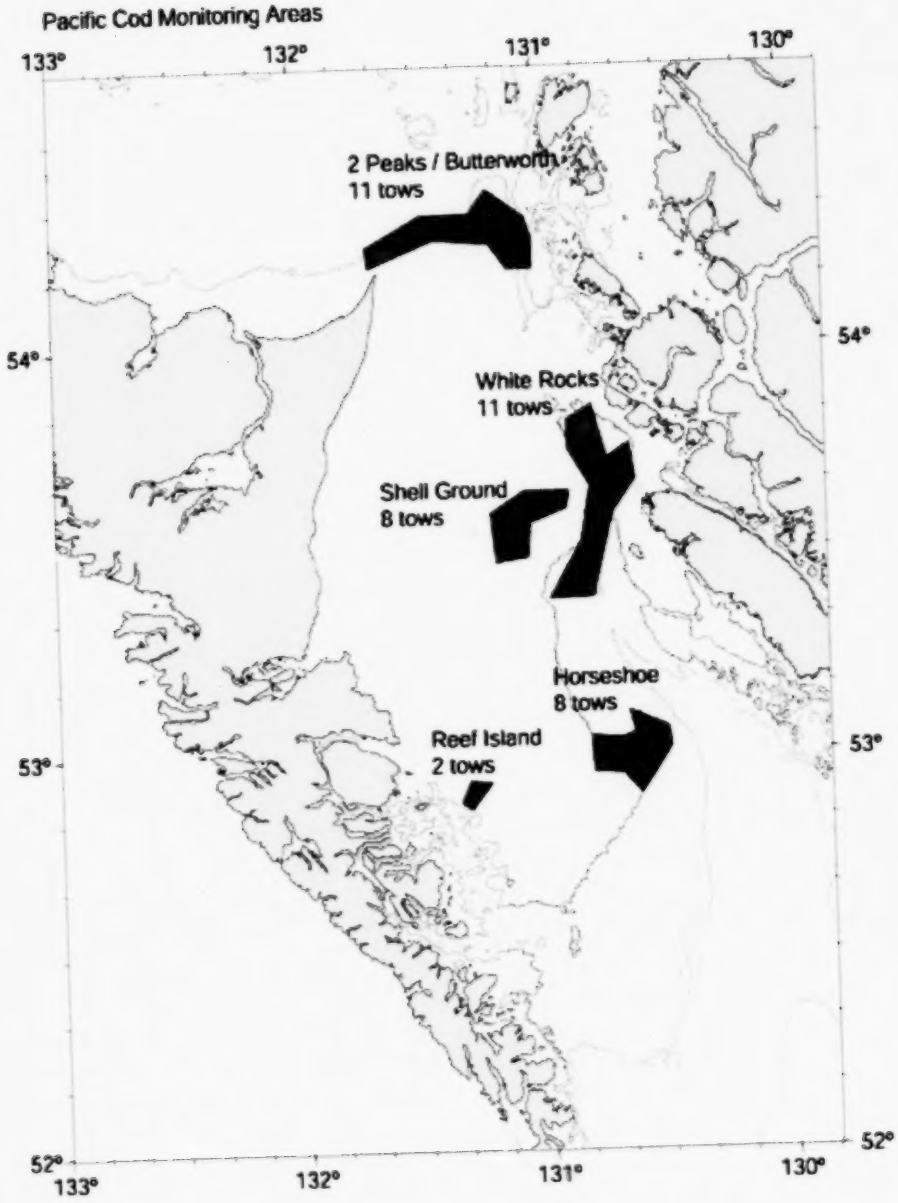
Pacific Cod Monitoring Areas
133°
132°
131°
130°
2 Peaks / Butterworth
11 tows
54°
White Rocks
11 tows
Shell Ground
8 tows
Horseshoe
8 tows
53°
Reef Island
2 tows
52°

Table1: Pre-selected set locations for the April 2002 Hecate Strait Pacific cod monitoring survey.

STATION	LON	LAT	AREA	DEPTH_F	A2_DEPTH	TYPE	LON_DEG	LON_MIN	LAT_DEG	LAT_MIN
1	-130.45	53.01	HS	79	HS_D	pri	-130	27	53	0.6
2	-130.76	52.98	HS	32	HS_S	pri	-130	45.6	52	58.8
3	-130.62	52.96	HS	56	HS_S	pri	-130	37.2	52	57.6
4	-130.68	53.01	HS	77	HS_D	pri	-130	40.8	53	0.6
5	-130.5	53.02	HS	54	HS_S	pri	-130	30	53	1.2
6	-130.57	53.06	HS	60	HS_S	pri	-130	34.2	53	3.6
7	-130.65	52.98	HS	67	HS_S	pri	-130	39	52	58.8
8	-131.31	52.9	RI	34	RI	pri	-131	18.6	52	54
9	-131.29	52.9	RI	53	RI	pri	-131	17.4	52	54
10	-131.09	53.56	SG	27	SG	pri	-131	5.4	53	33.6
11	-131.02	53.62	SG	30	SG	pri	-131	1.2	53	37.2
12	-131.15	53.55	SG	26	SG	pri	-131	9	53	33
13	-130.98	53.62	SG	30	SG	pri	-130	58.8	53	37.2
14	-131.17	53.57	SG	16	SG	pri	-131	10.2	53	34.2
15	-131.06	54.2	TPB	50	TPB_D	pri	-131	3.6	54	12
16	-131.43	54.26	TPB	58	TPB_D	pri	-131	25.8	54	15.6
17	-131.12	54.28	TPB	37	TPB_S	pri	-131	7.2	54	16.8
18	-131.05	54.24	TPB	56	TPB_D	pri	-131	3	54	14.4
19	-131.11	54.25	TPB	41	TPB_S	pri	-131	6.6	54	15
20	-131.07	54.2	TPB	45	TPB_S	pri	-131	4.2	54	12
21	-131.16	54.32	TPB	39	TPB_S	pri	-131	9.6	54	19.2
22	-131.51	54.27	TPB	48	TPB_S	pri	-131	30.6	54	16.2
23	-131.19	54.27	TPB	19	TPB_S	pri	-131	11.4	54	16.2
24	-131.2	54.31	TPB	39	TPB_S	pri	-131	12	54	18.6
25	-131.14	54.26	TPB	18	TPB_S	pri	-131	8.4	54	15.6
26	-130.82	53.48	WR	62	WR_D	pri	-130	49.2	53	28.8
27	-130.92	53.31	WR	53	WR_D	pri	-130	55.2	53	18.6
28	-130.76	53.65	WR	68	WR_D	pri	-130	45.6	53	39
29	-130.68	53.66	WR	85	WR_D	pri	-130	40.8	53	39.6
30	-130.76	53.51	WR	84	WR_D	pri	-130	45.6	53	30.6
31	-130.78	53.67	WR	52	WR_D	pri	-130	46.8	53	40.2
32	-130.65	53.71	WR	59	WR_D	pri	-130	39	53	42.6

Table1: Pre-selected set locations for the April 2002 Hecate Strait Pacific cod monitoring survey.

STATION	LON	LAT	AREA	DEPTH_F	A2_DEPTH	TYPE	LON_DEG	LON_MIN	LAT_DEG	LAT_MIN
1	-130.45	53.01	HS	79	HS_D	pri	-130	27	53	0.6
2	-130.76	52.98	HS	32	HS_S	pri	-130	45.6	52	58.8
3	-130.62	52.96	HS	56	HS_S	pri	-130	37.2	52	57.6
4	-130.68	53.01	HS	77	HS_D	pri	-130	40.8	53	0.6
5	-130.5	53.02	HS	54	HS_S	pri	-130	30	53	1.2
6	-130.57	53.06	HS	60	HS_S	pri	-130	34.2	53	3.6
7	-130.65	52.98	HS	67	HS_S	pri	-130	39	52	58.8
8	-131.31	52.9	RI	34	RI	pri	-131	18.6	52	54
9	-131.29	52.9	RI	53	RI	pri	-131	17.4	52	54
10	-131.09	53.56	SG	27	SG	pri	-131	5.4	53	33.6
11	-131.02	53.62	SG	30	SG	pri	-131	1.2	53	37.2
12	-131.15	53.55	SG	26	SG	pri	-131	9	53	33
13	-130.98	53.62	SG	30	SG	pri	-130	58.8	53	37.2
14	-131.17	53.57	SG	16	SG	pri	-131	10.2	53	34.2
15	-131.06	54.2	TPB	50	TPB_D	pri	-131	3.6	54	12
16	-131.43	54.26	TPB	58	TPB_D	pri	-131	25.8	54	15.6
17	-131.12	54.28	TPB	37	TPB_S	pri	-131	7.2	54	16.8
18	-131.05	54.24	TPB	56	TPB_D	pri	-131	3	54	14.4
19	-131.11	54.25	TPB	41	TPB_S	pri	-131	6.6	54	15
20	-131.07	54.2	TPB	45	TPB_S	pri	-131	4.2	54	12
21	-131.16	54.32	TPB	39	TPB_S	pri	-131	9.6	54	19.2
22	-131.51	54.27	TPB	48	TPB_S	pri	-131	30.6	54	16.2
23	-131.19	54.27	TPB	19	TPB_S	pri	-131	11.4	54	16.2
24	-131.2	54.31	TPB	39	TPB_S	pri	-131	12	54	18.6
25	-131.14	54.26	TPB	18	TPB_S	pri	-131	8.4	54	15.6
26	-130.82	53.48	WR	62	WR_D	pri	-130	49.2	53	28.8
27	-130.92	53.31	WR	53	WR_D	pri	-130	55.2	53	18.6
28	-130.76	53.65	WR	68	WR_D	pri	-130	45.6	53	39
29	-130.68	53.66	WR	65	WR_D	pri	-130	40.8	53	39.6
30	-130.76	53.51	WR	84	WR_D	pri	-130	45.6	53	30.6
31	-130.78	53.67	WR	52	WR_D	pri	-130	46.8	53	40.2
32	-130.65	53.71	WR	59	WR_D	pri	-130	39	53	42.6

Table 1: con't

STATION	LON	LAT	AREA	DEPTH_F	A2_DEPTH	TYPE	LON_DEG	LON_MIN	LAT_DEG	LAT_MIN
33	-130.76	53.67	WR	66	WR_D	pri	-130	45.6	53	40.2
34	-130.81	53.73	WR	55	WR_D	pri	-130	48.6	53	43.8
35	-130.86	53.74	WR	43	WR_S	pri	-130	51.6	53	44.4
36	-130.79	53.82	WR	57	WR_D	pri	-130	47.4	53	49.2
37	-130.63	52.96	HS	59	HS_S	alt	-130	37.8	52	57.6
38	-130.8	52.99	HS	35	HS_S	alt	-130	48	52	59.4
39	-130.68	52.96	HS	43	HS_S	alt	-130	40.8	52	57.6
40	-131.3	52.89	RI	60	RI	alt	-131	18	52	53.4
41	-131.25	52.92	RI	49	RI	alt	-131	15	52	55.2
42	-131.04	53.61	SG	31	SG	alt	-131	2.4	53	36.6
43	-131.01	53.59	SG	30	SG	alt	-131	0.6	53	35.4
44	-130.95	53.62	SG	32	SG	alt	-130	57	53	37.2
45	-131.4	54.29	TPB	46	TPB_S	alt	-131	24	54	17.4
46	-131.33	54.28	TPB	22	TPB_S	alt	-131	19.8	54	16.8
47	-131.17	54.36	TPB	39	TPB_S	alt	-131	10.2	54	21.6
48	-131.39	54.29	TPB	43	TPB_S	alt	-131	23.4	54	17.4
49	-130.75	53.67	WR	74	WR_D	alt	-130	45	53	40.2
50	-130.77	53.73	WR	72	WR_D	alt	-130	46.2	53	43.8
51	-130.69	53.65	WR	77	WR_D	alt	-130	41.4	53	39
52	-130.89	53.44	WR	65	WR_D	alt	-130	53.4	53	26.4

Table 1: con't

STATION	LON	LAT	AREA	DEPTH_F	A2_DEPTH	TYPE	LON_DEG	LON_MIN	LAT_DEG	LAT_MIN
33	-130.76	53.67	WR	66	WR_D	pri	-130	45.6	53	40.2
34	-130.81	53.73	WR	55	WR_D	pri	-130	48.6	53	43.8
35	-130.86	53.74	WR	43	WR_S	pri	-130	51.6	53	44.4
36	-130.79	53.82	WR	57	WR_D	pri	-130	47.4	53	49.2
37	-130.63	52.96	HS	59	HS_S	alt	-130	37.8	52	57.6
38	-130.8	52.99	HS	35	HS_S	alt	-130	48	52	59.4
39	-130.68	52.96	HS	43	HS_S	alt	-130	40.8	52	57.6
40	-131.3	52.89	RI	60	RI	alt	-131	18	52	53.4
41	-131.25	52.92	RI	49	RI	alt	-131	15	52	55.2
42	-131.04	53.61	SG	31	SG	alt	-131	2.4	53	36.6
43	-131.01	53.59	SG	30	SG	alt	-131	0.6	53	35.4
44	-130.95	53.62	SG	32	SG	alt	-130	57	53	37.2
45	-131.4	54.29	TPB	46	TPB_S	alt	-131	24	54	17.4
46	-131.33	54.28	TPB	22	TPB_S	alt	-131	19.8	54	16.8
47	-131.17	54.36	TPB	39	TPB_S	alt	-131	10.2	54	21.6
48	-131.39	54.29	TPB	43	TPB_S	alt	-131	23.4	54	17.4
49	-130.75	53.67	WR	74	WR_D	alt	-130	45	53	40.2
50	-130.77	53.73	WR	72	WR_D	alt	-130	46.2	53	43.8
51	-130.69	53.65	WR	77	WR_D	alt	-130	41.4	53	39
52	-130.89	53.44	WR	65	WR_D	alt	-130	53.4	53	26.4

Annex 2:

Set location information for all sets completed during the 2002 March to July cod monitoring surveys in Hecate Strait. Sets selected by the vessel skipper are indicated in bold.

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
3	20	1	7:45	8:16	224	3.0	31	52	54.5	131	16.4	52	53.1	131	18.4	106	133	usable
3	20	2	9:08	9:40	39	2.9	32	52	52.8	131	20.1	52	54.2	131	18.1	95	107	usable
3	21	3	6:31	7:05	133	3.0	34	53	3.1	130	32.3	53	1.6	130	31.3	115	118	usable
3	21	4	7:30	8:03	208	2.9	33	53	0.5	130	31.5	52	59.1	130	32.7	115	96	usable
3	21	5	8:30	9:00	163	3.0	30	52	58.7	130	32.0	52	56.9	130	31.7	98	104	usable
3	21	6	9:41	10:17	351	3.0	36	52	59.6	130	33.5	53	1.3	130	34.1	93	91	usable
3	21	7	11:00	11:31	188	2.9	31	53	0.2	130	41.7	52	58.6	130	40.7	122	102	usable
3	21	8	12:00	12:31	270	2.9	31	52	58.6	130	40.3	52	58.9	130	43.2	107	93	usable
3	21	9	13:01	13:31	109	3.0	30	52	59.1	130	46.5	52	58.4	130	44.3	82	80	usable
3	21	10	13:56	14:27	241	3.1	31	52	57.4	130	43.6	52	57.1	130	46.3	58	51	usable
3	21	11	17:29	18:00	34	3.0	31	53	24.8	130	54.5	53	26.2	130	53.0	122	124	usable
3	22	12	6:25	6:57	188	3.0	32	53	29.0	130	50.3	53	27.3	130	51.1	107	122	usable
3	22	13	8:02	8:32	304	3.0	30	53	31.8	131	3.9	53	32.7	131	6.0	53	53	usable
3	22	14	8:52	9:23	125	3.0	31	53	33.8	131	6.9	53	32.2	131	5.4	55	55	usable
3	22	15	9:53	10:27	340	3.1	34	53	30.9	131	8.7	53	32.3	131	7.7	49	53	usable
3	22	16	10:50	11:25	238	3.1	35	53	32.9	131	7.0	53	31.8	131	9.4	51	51	usable
3	22	17	11:43	12:13	354	2.9	30	53	30.6	131	9.7	53	31.8	131	10.6	40	29	usable
3	22	18	12:45	13:17	53	3.1	32	53	34.2	131	8.1	53	35.7	131	6.6	64	64	usable
3	22	19	13:42	14:14	94	3.1	32	53	37.2	131	4.8	53	37.6	131	2.2	53	49	usable
3	22	20	14:30	15:00	163	3.0	30	53	37.9	131	1.6	53	36.4	131	0.8	49	42	usable
3	22	21	16:10	16:42	32	3.1	32	53	33.2	130	46.4	53	34.7	130	45.8	109	127	usable
3	22	22	17:00	17:33	9	3.0	33	53	35.7	130	46.1	53	37.4	130	46.2	131	118	usable
3	23	23	6:37	7:07	203	3.0	30	53	42.0	130	39.2	53	40.4	130	39.9	120	120	usable
3	23	24	7:27	7:59	189	3.1	32	53	40.8	130	40.3	53	39.1	130	40.0	126	116	usable
3	23	25	8:40	9:12	11	3.1	32	53	37.1	130	46.3	53	38.6	130	45.9	116	122	usable
3	23	26	9:32	10:02	5	3.0	30	53	39.3	130	45.7	53	40.7	130	40.8	122	133	usable
3	23	27	10:21	10:52	357	3.0	31	53	40.3	130	45.9	53	41.7	130	46.9	91	69	usable
3	23	28	11:40	12:12	350	3.0	32	53	46.7	130	51.5	53	48.2	130	50.3	104	106	usable
3	23	29	12:32	13:02	214	3.0	30	53	48.3	130	49.1	53	47.1	130	50.8	111	109	usable
3	23	30	16:05	16:36	354	3.1	31	54	13.4	131	4.4	54	14.9	131	4.1	60	58	usable
3	23	31	16:55	17:25	100	3.0	30	54	14.9	131	3.6	54	16.3	131	3.6	75	80	usable

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
3	23	32	17:40	18:20	173	3.0	40	54	16.9	131	4.2	54	18.1	131	4.9	84	76	usable
3	24	33	6:26	7:00	60	3.1	34	54	16.7	131	28.7	54	17.2	131	26.6	75	67	usable
3	24	34	7:20	7:50	69	2.9	30	54	18.1	131	24.0	54	18.1	131	21.2	89	75	usable
3	24	35	8:13	8:43	74	3.0	30	54	18.6	131	18.4	54	18.3	131	15.8	98	82	usable
3	24	36	9:00	9:31	24	3.0	31	54	18.9	131	15.3	54	20.4	131	13.4	91	84	usable
3	24	37	9:59	10:29	154	3.0	30	54	20.9	131	14.3	54	19.5	131	13.2	87	76	usable
3	24	38	10:47	11:19	47	3.0	32	54	19.2	131	13.8	54	20.4	131	12.1	78	71	usable
3	24	39	11:38	12:10	212	3.0	32	54	20.2	131	10.3	54	19.1	131	12.9	66	73	usable
3	24	40	12:40	13:10	297	3.0	30	54	16.1	131	12.7	54	16.0	131	10.1	24	25	usable
4	24	1	7:02	7:36	236	3.0	34	52	54.6	131	16.3	52	53.4	131	18.0	102	113	usable
4	24	2	7:58	8:32	30	3.0	34	52	53.6	131	19.3	52	54.8	131	16.9	95	95	usable
4	24	3	12:04	12:34	336	3.0	30	52	59.5	130	26.3	53	0.9	130	27.1	126	151	usable
4	24	4	12:56	13:26	313	3.1	30	53	0.9	130	28.7	53	2.0	130	30.2	122	122	usable
4	24	5	13:50	14:25	282	3.1	35	53	2.6	130	32.7	53	3.9	130	34.4	107	104	usable
4	24	6	15:20	15:50	137	3.1	30	53	1.0	130	41.5	52	59.8	130	39.8	127	140	usable
4	24	7	16:12	16:42	122	2.9	30	52	59.0	130	40.6	52	58.2	130	38.2	127	120	usable
4	24	8	17:02	17:30	313	3.0	28	52	57.5	130	37.3	52	58.2	130	39.3	113	98	usable
4	24	9	17:50	18:21	282	3.1	31	52	58.5	130	41.7	52	58.3	130	44.8	66	75	usable
4	25	10	6:20	6:50	2	3.0	30	53	18.2	130	55.9	53	19.7	130	56.2	95	93	usable
4	**25**	**11**	**7:45**	**8:20**	**59**	**3.1**	**35**	**53**	**26.1**	**130**	**52.9**	**53**	**26.4**	**130**	**50.5**	**120**	**118**	**skipper**
4	25	12	8:50	9:22	67	3.1	32	53	27.2	130	52.1	53	28.2	130	49.8	115	116	usable
4	25	13	9:55	10:27	15	3.1	32	53	30.3	130	46.3	53	32.1	130	46.4	151	127	usable
4	25	14	11:45	12:15	253	3.1	30	53	34.3	131	4.3	53	34.2	131	6.9	46	64	usable
4	25	15	12:37	13:07	188	3.1	30	53	35.1	131	8.1	53	34.0	131	9.9	64	56	usable
4	25	16	13:29	13:59	93	3.1	30	53	33.1	131	9.2	53	33.4	131	6.8	71	58	usable
4	25	17	14:40	15:10	67	3.1	30	53	36.9	131	5.1	53	37.6	131	2.6	51	60	usable
4	25	18	15:33	16:03	113	3.1	30	53	38.1	131	1.7	53	37.4	130	59.1	58	51	usable
4	25	19	17:02	17:32	23	3.1	30	53	39.6	130	47.3	53	41.0	130	46.5	66	75	usable
4	26	20	6:40	7:10	201	3.0	30	53	42.2	130	39.4	53	40.7	130	40.2	120	120	usable
4	26	21	7:34	8:04	115	3.0	30	53	40.9	130	40.3	53	39.5	130	40.6	122	120	usable
4	26	22	8:42	9:12	182	3.0	30	53	37.8	130	46.2	53	40.3	130	45.6	115	120	usable

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
4	26	23	9:32	10:02	128	3.1	30	53	39.8	130	45.9	53	41.3	130	45.3	104	111	usable
4	26	24	10:25	10:55	329	3.0	30	53	42.6	130	46.5	53	44.0	130	47.4	116	106	usable
4	26	25	11:20	11:50	293	3.1	30	53	44.2	130	49.2	53	44.8	130	51.5	86	75	usable
4	26	26	12:30	13:00	63	3.1	30	53	47.8	130	51.5	53	48.3	130	49.1	106	113	usable
4	28	27	6:14	6:44	25	3.0	30	54	16.1	131	31.5	54	16.8	131	29.1	76	80	usable
4	**28**	**28**	**7:07**	**7:37**	**50**	**3.0**	**30**	**54**	**17.1**	**131**	**29.1**	**54**	**17.4**	**131**	**26.4**	**95**	**71**	**skipper**
4	28	29	8:00	8:30	221	3.1	30	54	17.5	131	24.3	54	16.2	131	25.4	51	38	usable
4	**28**	**30**	**8:57**	**9:27**	**48**	**3.1**	**30**	**54**	**17.6**	**131**	**25.6**	**54**	**18.0**	**131**	**22.8**	**76**	**71**	**skipper**
4	28	31	9:54	10:25	43	3.0	31	54	17.7	131	23.8	54	18.0	131	20.8	60	58	usable
4	**28**	**32**	**10:52**	**11:22**	**53**	**3.1**	**30**	**54**	**18.3**	**131**	**20.7**	**54**	**17.9**	**131**	**17.9**	**86**	**49**	**skipper**
4	28	33	12:33	13:04	82	3.0	31	54	19.1	131	15.7	54	18.7	131	12.6	93	69	usable
4	28	34	13:26	13:57	212	3.1	31	54	18.6	131	11.2	54	19.3	131	8.7	64	64	usable
4	28	35	14:29	14:59	261	3.0	30	54	17.0	131	5.8	54	16.8	131	8.2	51	46	usable
4	28	36	15:24	15:54	61	3.1	30	54	16.0	131	11.4	54	16.0	131	9.0	27	29	usable
4	28	37	16:16	16:46	206	3.1	30	54	14.8	131	6.8	54	13.5	131	7.6	31	29	usable
4	28	38	17:12	17:42	62	3.1	30	54	13.7	131	4.1	54	12.3	131	4.1	71	84	usable
4	28	39	18:00	18:30	23	3.0	30	54	11.8	131	3.8	54	13.2	131	3.0	93	102	usable
4	28	40	18:48	19:18	8	3.1	30	54	13.8	131	2.9	54	15.3	131	2.9	104	107	usable
5	22	1	6:14	6:44	195	2.7	30	52	54.7	131	16.2	52	53.7	131	17.9	100	120	usable
5	22	2	7:10	7:40	94	2.9	30	52	54.9	131	17.0	52	55.7	131	15.0	80	80	usable
5	22	3	9:38	10:08	130	2.9	30	52	57.8	130	48.6	52	57.2	130	46.3	64	51	usable
5	22	4	10:43	11:14	135	3.0	31	52	59.6	130	41.9	52	58.6	130	39.7	118	122	usable
5	22	5	11:40	12:10	339	3.0	30	52	59.7	130	37.2	53	1.3	130	37.6	124	102	usable
5	22	6	12:34	13:04	149	2.9	30	53	2.0	130	36.5	53	0.7	130	34.9	93	91	usable
5	22	7	13:29	13:59	355	2.9	30	53	0.6	130	33.2	53	2.1	130	33.6	93	91	usable
5	22	8	14:39	15:10	330	3.0	31	53	1.8	130	28.4	53	3.1	130	30.1	127	118	usable
5	22	9	15:32	16:02	310	2.9	30	53	2.9	130	31.7	53	3.8	130	34.1	111	93	usable
5	23	10	6:08	6:38	2	2.9	30	53	17.9	130	57.9	53	19.5	130	57.8	87	91	usable
5	23	11	7:04	7:34	20	3.0	30	53	19.6	130	55.9	53	21.1	130	56.0	96	111	usable
5	23	12	8:00	8:30	327	3.0	30	53	19.6	130	59.6	53	22.1	131	1.2	84	76	usable
5	**23**	**13**	**9:27**	**9:55**	**46**	**3.0**	**28**	**53**	**25.8**	**130**	**53.0**	**53**	**26.2**	**130**	**51.2**	**124**	**122**	**skipper**

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
5	23	14	10:42	11:12	25	2.9	30	53	30.9	130	47.7	53	32.4	130	46.5	107	111	usable
5	23	15	11:35	12:05	355	2.9	30	53	33.4	130	44.4	53	35.6	130	44.8	164	178	snag
5	23	16	13:33	14:03	0	2.9	30	53	36.1	130	45.1	53	37.7	130	45.4	167	146	usable
5	23	17	14:24	14:54	20	2.9	30	53	38.1	130	46.6	53	39.5	130	45.5	91	120	usable
5	23	18	15:26	15:58	50	3.0	32	53	38.8	130	40.8	53	40.3	130	39.3	116	109	usable
5	23	19	16:22	16:57	15	3.0	35	53	41.5	130	39.0	53	43.4	130	38.8	109	118	usable
5	23	20	17:36	18:07	285	3.0	31	53	41.6	130	45.1	53	42.3	130	47.5	124	67	usable
5	24	21	6:02	6:32	246	2.9	30	53	37.2	131	3.1	53	36.5	131	5.4	40	46	usable
5	24	22	6:54	7:25	220	2.9	31	53	34.9	131	6.5	53	34.0	131	8.7	49	64	usable
5	24	23	7:55	8:28	86	2.9	33	53	31.9	131	9.8	53	32.4	131	7.1	62	46	usable
5	24	24	11:06	11:36	105	2.9	30	53	37.6	131	1.1	53	38.0	130	58.3	55	64	usable
5	24	25	12:03	12:34	118	2.9	31	53	37.4	130	56.4	53	37.3	130	53.6	60	53	usable
5	24	26	13:27	13:57	340	3.0	30	53	44.1	130	49.3	53	45.1	130	51.4	84	84	usable
5	24	27	14:25	14:56	28	3.0	31	53	47.6	130	51.0	53	48.8	130	49.2	111	98	usable
5	24	28	17:39	18:09	0	2.9	30	54	12.6	131	3.4	54	14.2	131	3.6	93	75	usable
5	25	29	5:56	6:24	51	2.9	28	54	15.7	131	30.4	54	16.7	131	28.5	53	66	usable
5	25	30	6:47	7:17	70	3.0	30	54	16.8	131	29.7	54	17.1	131	26.9	84	66	usable
5	25	31	7:36	8:06	60	3.0	30	54	17.3	131	27.2	54	17.9	131	24.5	80	80	usable
5	**25**	**32**	**8:34**	**9:05**	**75**	**3.0**	**31**	**54**	**17.9**	**131**	**25.0**	**54**	**18.0**	**131**	**22.0**	**87**	**69**	**skipper**
5	**25**	**33**	**10:04**	**10:34**	**62**	**3.0**	**30**	**54**	**17.6**	**131**	**25.3**	**54**	**18.0**	**131**	**22.6**	**73**	**71**	**skipper**
5	25	34	11:07	11:37	88	3.0	30	54	18.3	131	21.2	54	17.9	131	18.6	93	56	usable
5	**25**	**35**	**12:00**	**12:31**	**65**	**3.0**	**31**	**54**	**18.5**	**131**	**19.0**	**54**	**18.1**	**131**	**16.5**	**96**	**69**	**skipper**
5	25	36	14:17	14:47	98	2.9	30	54	15.9	131	13.0	54	16.2	131	10.4	25	29	usable
5	25	37	15:10	15:41	246	2.9	31	54	16.3	131	8.8	54	16.8	131	11.3	31	35	usable
5	25	38	16:41	17:11	145	2.9	30	54	18.1	131	13.4	54	17.5	131	11.7	67	56	usable
5	25	39	17:27	17:57	85	3.0	30	54	18.4	131	11.7	54	19.9	131	11.4	62	66	usable
5	25	40	18:15	18:45	154	2.9	30	54	19.7	131	10.4	54	18.7	131	8.4	62	56	usable
5	25	41	19:02	19:32	154	2.9	30	54	18.4	131	6.8	54	17.3	131	5.2	60	60	usable
6	15	1	6:35	7:05	217	3.0	30	52	53.9	131	17.4	52	52.6	131	18.6	107	100	usable
6	15	2	7:27	7:57	345	3.0	30	52	52.1	131	19.3	52	53.5	131	19.3	93	104	usable
6	15	3	10:11	10:44	95	2.9	33	52	57.5	130	47.4	52	57.6	130	46.6	53	56	usable

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
6	15	4	11:18	11:48	110	2.9	30	52	58.5	130	41.0	52	57.9	130	38.6	80	76	usable
6	15	5	12:10	12:40	310	2.9	30	52	58.8	130	40.5	52	59.8	130	42.5	111	102	usable
6	15	6	13:28	13:58	35	3.0	30	53	2.3	130	36.9	53	3.9	130	35.8	95	91	usable
6	15	7	14:24	14:54	125	2.9	30	53	4.7	130	34.3	53	4.3	130	31.8	140	126	usable
6	15	8	15:51	16:23	325	3.0	32	53	0.1	130	31.6	53	1.5	130	33.1	102	93	usable
6	15	9	16:52	17:22	310	3.0	30	52	59.8	130	35.4	53	1.0	130	37.3	96	106	usable
6	16	10	6:00	6:30	355	3.0	30	53	20.6	130	57.5	53	22.2	130	58.2	93	104	usable
6	16	11	7:14	7:44	65	3.0	30	53	26.0	130	54.0	53	26.8	130	51.8	116	120	usable
6	16	12	8:04	8:34	102	3.0	30	53	27.2	130	51.1	53	26.2	130	49.1	126	127	usable
6	16	13	8:54	9:24	5	2.9	30	53	26.7	130	49.4	53	28.2	130	49.1	124	118	usable
6	16	14	10:00	10:30	17	3.0	30	53	31.7	130	47.2	53	33.3	130	46.8	102	100	usable
6	16	15	10:49	11:19	165	2.9	30	53	33.3	130	46.4	53	31.7	130	46.5	113	126	usable
6	16	16	12:12	12:42	15	3.0	30	53	37.6	130	46.3	53	39.1	130	45.6	115	122	usable
6	16	17	13:13	13:43	45	3.0	30	53	38.2	130	41.4	53	39.3	130	39.7	106	106	usable
6	16	18	14:06	14:36	10	3.0	30	53	41.0	130	39.4	53	42.5	130	39.5	113	124	usable
6	16	19	15:07	15:37	10	3.0	30	53	42.2	130	44.8	53	43.1	130	47.2	127	98	usable
6	16	20	17:08	17:38	240	3.0	30	53	34.5	131	2.2	53	34.2	131	4.6	44	46	usable
6	16	21	17:53	18:24	190	2.9	31	53	34.4	131	6.3	53	32.7	131	6.5	47	49	usable
6	17	22	6:07	6:37	65	2.9	30	53	31.6	131	8.9	53	32.5	131	7.1	55	47	usable
6	17	23	7:00	7:30	10	2.9	30	53	34.8	131	6.3	53	36.3	131	6.1	49	56	usable
6	17	24	7:49	8:19	66	2.9	30	53	37.1	131	3.9	53	37.4	131	1.5	49	49	usable
6	17	25	9:36	10:06	63	3.0	30	53	45.5	130	50.0	53	46.6	130	48.1	109	126	usable
6	17	26	13:14	13:44	15	2.9	30	54	11.4	131	3.4	54	12.8	131	2.9	100	104	usable
6	17	27	14:06	14:36	25	2.9	30	54	12.7	131	3.4	54	14.1	131	2.6	93	107	usable
6	17	28	14:59	15:30	350	2.9	31	54	15.1	131	2.7	54	16.6	131	3.4	111	115	usable
6	17	29	15:57	16:27	175	3.0	30	54	16.7	131	4.1	54	15.2	131	2.9	78	106	usable
6	17	30	16:52	17:22	305	2.9	30	54	15.6	131	5.3	54	16.1	131	7.3	44	25	usable
6	17	31	17:40	18:10	95	2.9	30	54	15.9	131	9.1	54	15.6	131	6.5	27	27	usable
6	18	32	6:08	6:38	265	2.9	30	54	16.4	131	30.5	54	16.0	131	32.9	78	100	usable
6	18	33	7:08	7:38	75	3.0	30	54	17.0	131	28.6	54	17.2	131	26.0	86	66	usable
6	**18**	**34**	**8:07**	**8:37**	**45**	**3.0**	**30**	**54**	**17.6**	**131**	**25.2**	**54**	**17.7**	**131**	**22.8**	**75**	**53**	**skipper**

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
6	**18**	**35**	**9:15**	**9:45**	**75**	**2.9**	**30**	**54**	**18.1**	**131**	**23.8**	**54**	**18.1**	**131**	**21.1**	**91**	**60**	**skipper**
6	**18**	**36**	**10:11**	**10:40**	**95**	**3.0**	**29**	**54**	**18.3**	**131**	**20.8**	**54**	**18.1**	**131**	**18.3**	**86**	**71**	**skipper**
6	**18**	**37**	**12:07**	**12:37**	**104**	**2.9**	**30**	**54**	**18.5**	**131**	**18.2**	**54**	**18.3**	**131**	**15.7**	**89**	**76**	**skipper**
6	18	38	13:00	13:30	132	2.9	30	54	18.6	131	14.9	54	17.6	131	12.7	78	56	usable
6	18	39	14:09	14:39	155	2.9	30	54	20.4	131	9.2	54	19.4	131	7.1	64	71	usable
6	18	40	15:01	15:32	160	3.0	31	54	18.8	131	5.1	54	17.2	131	3.6	111	116	usable
7	17	1	6:51	7:21	165	3.0	30	53	45.6	130	52.6	53	44.3	130	51.6	87	66	usable
7	17	2	7:44	8:14	135	3.0	30	53	45.4	130	50.0	53	44.2	130	48.5	107	106	usable
7	17	3	8:55	9:25	145	3.0	30	53	44.5	130	40.9	53	43.2	130	39.4	135	126	usable
7	17	4	9:47	10:13	185	3.0	26	53	42.7	130	40.4	53	41.4	130	39.7	135	118	usable
7	17	5	10:45	11:15	214	3.0	30	53	39.9	130	39.6	53	38.1	130	41.4	102	102	usable
7	17	6	11:38	12:08	25	3.0	30	53	38.8	130	41.4	53	39.7	130	39.6	129	109	usable
7	17	7	12:48	13:18	200	3.0	30	53	39.3	130	46.1	53	37.2	130	46.6	102	93	usable
7	17	8	13:39	14:09	175	3.0	30	53	37.2	130	46.7	53	35.5	130	46.6	87	93	usable
7	17	9	14:28	14:58	179	3.0	30	53	34.5	130	46.7	53	33.1	130	47.4	96	98	usable
7	17	10	16:30	17:00	145	3.0	30	53	22.3	130	56.1	53	21.0	130	57.0	96	95	usable
7	17	11	17:24	17:54	175	3.0	30	53	19.6	130	56.2	53	18.1	130	56.5	96	95	usable
7	18	12	6:06	6:36	205	3.0	30	52	54.3	131	16.2	52	52.9	131	17.2	66	67	usable
7	18	13	6:56	7:26	32	3.0	30	52	53.3	131	18.3	52	54.6	131	17.0	144	102	usable
7	18	14	9:29	9:59	105	3.0	30	52	59.9	130	47.9	52	59.1	130	45.4	82	91	usable
7	**18**	**15**	**10:18**	**10:48**	**105**	**3.0**	**30**	**52**	**58.9**	**130**	**42.9**	**52**	**58.4**	**130**	**40.6**	**95**	**76**	**skipper**
7	18	16	11:26	11:56	140	3.0	30	53	0.3	130	36.0	52	59.2	130	34.0	93	95	usable
7	18	17	12:42	13:22	15	3.0	40	52	56.6	130	25.7	52	58.2	130	25.0	131	138	usable
7	18	18	13:42	14:12	335	3.0	30	52	59.3	130	25.9	53	0.7	130	27.0	124	135	usable
7	18	19	14:35	15:05	325	3.0	30	53	1.4	130	27.4	53	2.6	130	29.2	153	127	usable
7	18	20	15:50	16:21	345	3.0	31	53	0.7	130	32.9	53	2.3	130	33.9	91	89	usable
7	18	21	16:50	17:20	300	3.0	30	53	4.8	130	35.4	53	5.6	130	37.5	131	142	usable
7	19	22	5:58	6:28	175	2.9	30	53	35.5	131	10.8	53	34.1	131	10.4	131	142	usable
7	19	23	6:51	7:21	85	2.9	30	53	32.9	131	8.4	53	33.8	131	6.6	60	51	usable
7	19	24	7:55	8:25	80	2.9	30	53	37.0	131	3.8	53	37.5	131	2.5	47	49	usable
7	19	25	8:44	9:14	165	2.9	30	53	37.2	131	1.5	53	35.8	131	0.7	46	42	usable

Annex 2: Continued

Month	Day	Set No.	Start Time	Finish Time	Direction (Degrees T)	Speed (Knots)	Duration (Min.)	Start				Finish				Depth (m)		Usability
								Latitude		Longitude		Latitude		Longitude		Start	Finish	
7	19	26	9:32	10:02	310	2.9	30	53	36.1	131	0.1	53	37.1	131	2.0	47	42	usable
7	**19**	**27**	**10:19**	**10:49**	**240**	**2.9**	**30**	**53**	**37.0**	**131**	**4.0**	**53**	**36.0**	**131**	**6.0**	**42**	**49**	**skipper**
7	19	28	14:31	15:01	20	2.9	30	54	11.0	131	3.6	54	12.5	131	3.2	100	102	usable
7	19	29	15:23	15:53	355	2.9	30	54	11.6	131	2.8	54	13.3	131	2.7	106	106	usable
7	19	30	16:30	17:00	315	3.0	30	54	16.7	131	4.5	54	17.9	131	5.8	66	67	usable
7	19	31	17:34	18:04	265	2.9	30	54	18.9	131	10.5	54	18.6	131	13.0	60	69	usable
7	**20**	**32**	**6:12**	**6:42**	**270**	**3.0**	**30**	**54**	**18.2**	**131**	**21.2**	**54**	**18.0**	**131**	**23.4**	**76**	**76**	**skipper**
7	20	33	6:58	7:29	265	3.0	31	54	17.7	131	25.1	54	16.9	131	26.3	71	67	usable
7	20	34	7:54	8:24	85	2.9	30	54	16.0	131	28.9	54	15.8	131	26.2	49	38	usable
7	20	35	8:58	9:25	75	3.0	27	54	17.9	131	24.7	54	17.6	131	22.7	87	46	usable
7	20	36	9:47	10:17	265	3.0	30	54	18.1	131	22.4	54	17.7	131	25.0	82	73	usable
7	**20**	**37**	**10:46**	**11:16**	**95**	**3.0**	**30**	**54**	**18.2**	**131**	**21.0**	**54**	**18.2**	**131**	**18.3**	**80**	**76**	**skipper**
7	20	38	11:37	12:07	105	3.0	30	54	18.2	131	18.3	54	17.8	131	15.8	80	49	usable
7	20	39	12:28	12:58	25	2.9	30	54	17.9	131	14.5	54	18.9	131	14.7	66	84	usable
7	20	40	13:14	13:44	100	2.9	30	54	19.6	131	12.4	54	19.7	131	9.8	71	62	usable

Annex 3 : Catch by species and tow for species with greater than 250 kg total catch over the course of all surveys. All weights are in kilograms; a catch weight of 0 indicates that trace amounts were present in the catch; dashes indicate no catch for the species in the set.

March Set	Pacific cod	Lingcod	Pacific tomcod	Walleye Pollock	Sablefish	Arrowtooth flounder	English sole	Rex sole	Dover sole	Rock sole	Pacific halibut	Sand sole	Flathead sole	Lefteye flounders	Starry flounder	Petrale sole	Spotted ratfish	Big skate	Spiny dogfish	Quillback rockfish	Silvergray rockfish	Yellowtail rockfish	Bocaccio
1	-	-	0	-	-	0	39	1	-	6	-	24	-	97	-	-	41	-	3	-	-	-	-
2	-	-	1	-	-	0	102	-	-	66	4	16	-	70	-	-	20	-	-	-	-	-	-
3	-	1	-	-	-	-	0	0	-	1	3	-	-	1	-	-	8	-	-	-	-	-	-
4	-	-	-	-	-	-	1	2	-	7	12	1	-	2	-	-	6	23	-	-	-	-	-
5	-	-	-	-	-	-	2	11	-	31	5	-	-	1	-	0	8	-	-	-	-	-	-
6	-	-	-	-	-	-	0	-	-	1	-	-	-	5	-	-	2	-	-	-	-	-	-
7	30	1	10	-	1	41	11	148	0	2	15	-	-	24	-	2	16	-	2	-	-	-	-
8	-	-	0	-	-	5	3	7	-	0	3	-	-	2	-	0	10	-	-	-	-	-	-
9	-	-	1	-	-	8	9	10	-	0	6	0	-	28	-	-	21	7	-	-	-	-	-
10	-	-	-	-	-	0	2	2	-	5	4	1	-	9	-	-	10	-	-	-	-	-	-
11	10	-	0	-	-	6	53	162	-	5	-	1	-	-	-	0	-	22	8	2	0	260	-
12	18	0	0	-	-	17	100	35	1	-	5	-	-	5	-	-	10	23	1	-	2	2	-
13	3	-	0	-	-	4	8	1	-	58	-	15	-	-	-	-	2	27	-	1	-	-	-
14	0	-	3	-	-	1	5	-	-	64	-	50	-	-	-	-	1	-	1	1	-	4	-
15	0	-	7	-	-	-	2	-	-	27	-	23	-	-	-	-	1	-	-	-	-	-	-
16	-	-	11	-	-	0	10	-	-	49	63	41	-	-	-	-	2	26	2	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	3	-	-	-	176	-	-	79	-	317	-	29	-	-	5	18	-	-	-	-	-
19	-	-	0	-	-	-	14	-	-	188	3	55	-	2	-	-	18	4	-	-	-	-	-
20	3	-	-	-	-	-	2	-	-	88	3	15	-	-	-	-	18	-	-	-	-	-	-
21	6	1	7	-	-	7	29	58	0	8	15	-	-	1	-	0	10	140	-	-	-	-	-
22	25	-	8	-	-	32	20	363	-	-	-	-	14	-	-	-	-	91	1	-	3	-	-
23	21	-	7	0	0	15	128	77	-	-	-	-	-	19	-	5	10	-	-	-	-	-	-
24	0	-	9	0	-	24	115	63	-	-	-	-	5	9	-	5	6	45	-	-	-	-	-
25	71	-	12	-	0	17	23	219	1	-	5	-	9	8	-	4	-	-	1	-	-	-	-
26	5	-	10	-	0	22	28	247	40	-	-	-	96	-	-	-	2	-	3	-	-	0	-
27	-	-	6	-	-	5	134	30	3	1	2	3	31	116	-	-	2	18	-	-	-	-	-
28	7	-	76	-	0	29	38	82	-	-	-	-	311	47	-	-	44	-	-	-	-	-	-
29	-	-	116	-	12	-	155	116	7	-	-	-	1,157	163	-	-	32	45	-	-	-	-	11
30	15	-	1,128	-	-	24	104	-	-	-	12	539	34	-	2	-	24	159	-	-	-	-	-
31	27	-	86	-	-	190	237	60	-	-	-	-	-	165	-	-	423	386	-	-	-	-	-
32	7	-	6	-	-	129	444	2	-	-	8	18	-	-	-	5	356	159	-	-	-	-	-
33	39	-	0	-	-	9	17	-	-	4	41	2	-	-	3	-	16	227	-	-	-	-	-
34	77	1	32	-	-	26	24	-	-	1	13	1	-	-	3	-	8	113	-	-	-	-	-
35	29	3	40	-	-	50	65	-	-	-	27	0	-	0	-	-	8	125	5	-	-	-	-
36	44	7	0	-	-	1,361	466	5	-	-	56	-	2	-	-	-	1	21	-	-	-	-	-
37	1	-	6	-	-	184	81	1	-	-	10	0	-	-	-	2	27	9	-	-	-	-	-
38	14	17	0	-	-	78	81	0	-	-	5	2	-	-	-	-	25	32	-	-	-	-	-
39	8	-	0	-	-	10	39	-	-	0	6	5	-	-	-	-	13	36	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 3: Continued.

April Set	Pacific cod	Lingcod	Pacific tomcod	Walleye pollock	Sablefish	Arrowtooth flounder	English sole	Rex sole	Dover sole	Rock sole	Pacific halibut	Sand sole	Flathead sole	Pacific sanddab	Starry flounder	Butter sole	Petrale sole	Spotted ratfish	Big skate	Spiny dogfish	Silvergray rockfish	Yellowtail rockfish	Bocaccio
1	-	-	1	-	-	0	128	0	2	17	1	1	-	145	-	0	0	149	29	0	-	0	5
2	12	-	0	-	-	2	127	1	10	10	42	6	5	149	-	-	-	209	38	-	-	-	-
3	6	18	-	2	0	8	4	30	-	0	5	-	1	8	-	-	2	66	-	0	9	-	-
4	-	-	-	-	-	4	30	14	-	-	52	-	-	1	-	0	27	25	-	-	-	-	-
5	-	7	-	-	-	1	4	1	-	45	3	-	-	16	-	-	1	10	-	-	-	-	-
6	6	3	0	-	1	59	1	446	14	9	11	-	27	8	-	-	1	62	13	8	-	-	-
7	-	4	7	-	-	47	56	289	2	-	2	-	4	-	-	-	0	198	16	-	-	-	6
8	0	-	6	-	-	107	39	94	1	2	4	-	0	97	-	-	1	53	-	-	-	-	3
9	1	-	5	-	-	18	34	5	0	103	3	17	-	206	-	-	1	7	-	-	-	-	-
10	-	5	1	-	0	6	11	48	156	1	27	-	-	15	-	-	4	21	22	3	-	-	-
11	**43**	**15**	**1**	**2**	**4**	**157**	**7**	**141**	**49**	**-**	**9**	**-**	**67**	**1**	**-**	**-**	**4**	**24**	**41**	**0**	**-**	**-**	**2**
12	8	-	0	-	2	87	10	75	4	-	10	-	73	-	-	-	7	10	22	0	-	-	-
13	7	1	-	0	6	89	33	198	34	-	10	-	24	-	-	-	4	34	-	2	-	1	-
14	26	-	1	-	-	-	5	-	-	114	98	62	-	-	-	-	-	87	64	-	-	-	-
15	-	-	5	-	-	5	165	-	3	57	-	367	3	138	-	170	-	87	358	-	-	-	-
16	1	-	14	-	-	-	124	-	-	220	-	375	-	53	-	250	-	39	20	-	-	-	-
17	134	-	0	0	-	-	3	-	-	460	9	69	-	2	-	5	-	14	23	-	-	3	-
18	26	4	-	-	-	-	13	-	6	419	1	77	-	10	-	0	-	60	70	-	-	-	-
19	-	-	10	-	-	40	214	52	206	4	17	-	7	47	-	-	0	50	23	-	-	-	-
20	5	-	4	0	1	24	18	26	0	1	9	-	2	-	-	-	1	5	-	-	-	2	4
21	10	-	3	3	1	104	20	101	5	1	7	-	4	-	-	-	3	6	11	-	-	4	16
22	3	-	1	-	-	92	109	428	209	-	13	-	5	-	-	-	5	25	7	-	-	0	-
23	114	-	2	-	10	103	75	278	394	3	-	-	20	-	-	-	3	47	25	2	-	-	-
24	5	-	1	-	1	144	10	153	181	-	11	-	29	-	-	-	8	63	16	-	-	1	-
25	5	-	14	-	-	135	122	101	70	-	29	-	97	0	-	0	5	7	91	-	-	-	-
26	124	-	7	12	5	82	7	103	74	-	-	-	80	-	-	-	1	17	25	1	-	1	-
27	29	4	0	0	-	71	42	15	4	3	9	-	4	-	-	3	-	108	45	2	-	-	5
28	**84**	**2**	**0**	**0**	**-**	**66**	**32**	**8**	**1**	**6**	**28**	**1**	**2**	**0**	**-**	**1**	**-**	**44**	**36**	**-**	**-**	**-**	**-**
29	32	-	0	0	-	25	81	0	-	9	10	1	-	0	3	64	-	8	23	-	-	-	-
30	**217**	**2**	**1**	**0**	**-**	**88**	**54**	**7**	**0**	**5**	**40**	**-**	**-**	**0**	**5**	**32**	**-**	**15**	**33**	**-**	**-**	**-**	**-**
31	378	15	0	0	-	167	106	2	1	10	34	-	-	0	-	10	-	3	136	-	-	-	-
32	**175**	**18**	**46**	**-**	**-**	**377**	**131**	**21**	**-**	**19**	**7**	**18**	**-**	**-**	**-**	**-**	**-**	**4**	**68**	**-**	**-**	**5**	**15**
33	51	2	1	5	-	1,815	32	15	-	4	59	12	-	-	-	-	9	29	18	-	-	7	4
34	32	-	10	3	-	106	294	24	2	1	44	0	-	-	8	10	0	2	113	-	-	1	-
35	-	-	22	0	-	21	80	1	0	5	-	6	-	0	5	14	-	2	50	-	-	-	-
36	20	-	2	-	-	-	8	-	-	50	33	32	-	-	7	3	-	1	8	-	-	-	-
37	9	-	2	-	-	2	152	-	-	133	22	47	-	-	9	2	-	4	14	-	-	-	-
38	11	4	3	-	-	182	257	1,327	652	5	66	-	-	-	-	-	18	123	91	-	-	-	-
39	19	-	2	0	-	267	121	481	1,98 7	2	56	-	-	-	-	-	-	1,599	-	-	-	-	-
40	15	-	-	-	-	124	34	147	152	-	187	-	-	-	-	-	3	880	34	-	-	-	-

Annex 3: Continued

May Set	Pacific cod	Lingcod	Pacific tomcod	Walleye pollock	Sablefish	Arrowtooth flounder	English sole	Rex sole	Dover sole	Rock sole	Pacific halibut	Sand sole	Flathead sole	Pacific sanddab	Starry flounder	Butter sole	Petrale sole	Spotted ratfish	Big skate	Spiny dogfish	Silvergray rockfish	Yellowtail rockfish	Bocaccio
1	-	-	5	1	-	5	169	2	1	5	15	9	-	238	-	-	2	63	-	17	-	-	-
2	5	-	1	2	-	1	147	1	1	10	5	56	2	92	-	-	-	307	-	15	-	26	-
3	-	6	0	0	-	-	6	-	-	139	10	32	0	25	-	-	-	24	-	-	-	-	-
4	-	-	1	-	1	279	15	364	10	4	-	8	1	1	-	-	1	85	23	15	-	-	-
5	1	-	0	0	-	268	18	224	15	0	-	-	77	15	-	-	0	26	-	18	1	-	-
6	3	5	-	-	-	4	24	10	-	10	42	-	6	4	-	-	22	17	-	3	-	-	-
7	0	2	-	-	-	0	8	6	-	7	12	-	1	5	-	-	12	15	-	10	-	-	-
8	1	-	-	-	-	47	10	157	2	-	14	-	12	0	-	-	10	12	-	13	1	-	5
9	-	5	-	-	-	13	20	35	0	8	-	-	1	-	-	-	5	11	17	18	-	-	-
10	10	-	4	-	2	98	19	132	98	6	3	-	2	-	-	-	-	54	-	21	-	-	-
11	5	-	-	0	-	241	7	263	146	-	-	-	4	-	-	-	-	28	-	29	-	-	-
12	0	2	7	-	13	108	236	68	15	2	10	-	-	36	-	-	31	72	2	27	-	-	-
13	**5**	**-**	**-**	**0**	**-**	**24**	**3**	**50**	**24**	**-**	**-**	**-**	**29**	**6**	**-**	**-**	**-**	**2**	**-**	**5**	**2**	**-**	**-**
14	4	-	-	0	-	103	6	82	138	-	-	-	43	-	-	-	16	8	-	1	0	6	-
15	7	15	-	1	2	360	44	194	37	-	-	-	9	-	-	-	-	9	-	1	-	-	-
16	2	0	-	2	2	312	-	209	123	2	-	-	-	-	-	-	-	18	-	-	4	-	-
17	14	-	-	0	-	366	86	102	95	-	-	-	43	-	-	-	6	2	-	7	-	-	-
18	83	1	2	6	-	261	77	63	5	-	-	-	4	-	-	-	2	8	-	15	-	1	10
19	1	-	2	1	-	62	5	13	0	-	-	-	6	-	-	-	-	5	-	804	3	-	-
20	119	13	24	-	-	368	368	69	142	-	18	4	49	-	-	4	53	40	44	5	-	0	-
21	80	-	-	-	-	-	-	-	-	1,379	9	119	-	-	-	-	-	-	-	-	-	-	-
22	2	5	76	-	-	-	401	-	8	370	-	378	-	-	-	-	-	8	84	-	-	-	-
23	53	-	77	-	-	-	34	-	-	422	10	318	-	-	-	-	-	-	202	6	-	-	-
24	28	29	-	4	-	8	42	4	4	448	7	72	-	88	-	-	-	69	-	5	-	0	-
25	7	1	0	-	-	-	260	0	0	40	20	29	-	9	-	0	-	14	-	-	-	0	-
26	27	-	7	-	2	388	22	142	86	-	-	4	134	-	-	-	37	41	-	0	-	-	-
27	3	-	4	14	-	488	4	117	47	-	-	-	171	-	-	-	-	31	-	10	-	-	-
28	54	-	1	5	5	343	3,263	1,373	1,094	-	45	-	86	-	-	-	-	322	163	-	-	-	-
29	4	15	-	-	-	14	60	-	0	0	91	21	0	-	-	-	-	48	46	4	-	-	-
30	61	29	-	-	-	14	205	-	-	-	74	2	-	-	-	-	-	18	29	12	-	-	9
31	585	33	-	-	-	278	230	-	-	0	15	1	-	-	-	-	-	10	209	-	-	-	-
32	**476**	**62**	**-**	**-**	**-**	**139**	**62**	**-**	**-**	**-**	**25**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,038**	**4**	**-**	**-**	**5**
33	**25**	**51**	**-**	**-**	**-**	**76**	**7**	**-**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**795**	**39**	**-**	**-**	**-**
34	1,416	47	-	-	-	5,049	-	-	-	-	13	-	-	-	-	-	-	-	735	-	-	-	-
35	**1,595**	**-**	**-**	**-**	**-**	**5,066**	**74**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**54**	**-**	**-**	**-**	**-**
36	12	-	0	-	-	-	8	-	-	149	26	19	-	-	22	-	-	-	116	-	-	-	-
37	589	8	-	-	-	3	-	-	-	112	33	54	-	-	34	-	-	-	652	-	-	-	-
38	22	29	-	-	-	52	-	-	-	-	18	0	-	-	4	-	-	-	49	4	-	-	-
39	14	2	-	-	-	164	327	5	-	-	26	11	-	-	-	-	3	67	106	4	-	-	-
40	8	12	1	-	-	164	322	10	-	1	11	2	-	2	1	-	3	67	73	1	-	-	-
41	11	2	0	-	-	52	31	17	-	-	160	0	-	-	4	0	-	17	88	2	-	-	-

Annex 3: Continued

June Set	Pacific cod	Lingcod	Pacific tomcod	Walleye pollock	Sablefish	Arrowtooth flounder	English sole	Rex sole	Dover sole	Rock sole	Pacific halibut	Sand sole	Flathead sole	Pacific sanddab	Starry flounder	Butter sole	Petrale sole	Spotted ratfish	Big skate	Spiny dogfish	Silvergray rockfish	Yellowtail rockfish	Bocaccio
1	1	0	6	-	-	3	125	9	5	4	9	-	-	63	-	-	4	36	-	3	-	4	-
2	3	-	0	0	0	5	63	5	8	8	34	-	5	68	-	-	5	63	-	-	-	1	-
3	-	4	0	-	-	-	27	-	-	9	10	17	-	25	-	-	2	5	11	6	-	-	-
4	-	94	-	-	-	2	11	-	-	174	12	8	-	68	-	1	2	6	36	78	-	-	-
5	162	9	0	-	-	20	34	61	2	20	27	-	-	16	-	0	30	11	-	26	3	-	-
6	-	9	-	-	-	21	14	3	-	7	22	-	-	3	-	1	10	63	-	2	-	-	-
7	41	3	-	3	3	180	19	118	24	-	4	-	18	-	-	-	10	34	23	30	26	-	-
8	-	33	-	-	1	10	5	5	-	12	12	-	0	17	-	-	25	15	-	18	2	-	-
9	0	9	-	-	-	5	5	7	0	-	10	-	3	-	-	-	29	18	21	5	1	-	4
10	93	3	3	3	1	184	42	108	30	-	-	-	1	-	-	-	8	15	57	585	-	-	-
11	5	-	-	5	4	214	4	194	50	-	-	-	27	0	-	-	-	18	-	5	-	-	-
12	13	2	-	5	2	109	-	132	40	-	-	-	8	-	-	-	-	22	-	9	3	-	-
13	5	-	-	5	5	60	1	90	21	-	-	-	5	-	-	-	-	13	-	3	-	-	-
14	0	-	-	10	2	92	20	71	104	-	2	-	9	-	-	-	3	1	-	-	1	-	-
15	3	9	-	2	-	155	25	317	265	-	3	-	15	-	-	-	14	2	-	-	-	-	-
16	2	2	-	-	128	547	140	445	304	-	-	-	13	-	-	-	2	2	-	1	-	-	-
17	7	9	-	2	7	263	69	235	15	-	-	-	38	-	-	-	7	9	-	18	-	-	-
18	1	-	-	5	-	102	14	109	14	0	-	-	13	-	-	-	5	20	-	5	-	-	-
19	17	-	-	1	14	171	21	176	235	-	3	-	8	-	-	-	13	1	-	14	-	-	-
20	17	-	-	-	-	9	-	5	4	146	27	23	7	-	-	-	-	412	-	-	-	-	-
21	33	12	-	-	-	-	1	-	-	93	13	64	-	-	-	-	-	41	14	-	-	-	-
22	10	-	-	-	-	-	-	-	-	205	2	32	-	0	-	-	-	17	5	9	-	-	-
23	42	2	4	-	-	-	-	-	-	377	5	2	-	2	-	-	-	-	7	-	-	-	-
24	267	1	-	-	-	-	0	-	-	130	59	198	-	0	-	-	-	5	-	-	-	-	-
25	36	-	-	3	5	157	25	373	461	-	6	-	42	-	-	-	6	2	-	-	-	-	-
26	27	-	-	1	4	211	129	167	380	-	25	-	2	-	-	-	0	320	68	-	-	-	-
27	71	-	-	5	7	491	213	719	934	-	36	-	33	-	-	-	5	605	57	-	-	-	-
28	88	5	-	51	-	211	15	120	152	2	9	-	-	-	-	-	-	49	136	2	-	-	-
29	139	9	2	14	-	508	406	147	73	-	20	-	4	-	-	5	-	27	-	-	-	-	-
30	6	73	5	1	-	23	-	-	-	126	7	29	6	-	485	-	5	9	535	7	-	-	-
31	5	8	1	-	-	12	0	-	-	181	78	57	-	-	83	-	-	5	125	2	-	-	-
32	46	21	0	-	-	497	139	10	34	-	5	5	-	-	14	64	18	221	14	147	-	-	-
33	1,158	25	-	-	-	1,659	116	-	-	-	4	27	-	-	-	9	-	92	36	18	-	-	6
34	**104**	**38**	**-**	**-**	**-**	**3,195**	**59**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**1**	**5**	**-**	**-**	**-**	**-**	**-**
35	**1,176**	**24**	**-**	**-**	**-**	**5,355**	**74**	**-**	**2**	**-**	**32**	**-**	**-**	**-**	**-**	**-**	**5**	**9**	**120**	**-**	**-**	**-**	**9**
36	**1,161**	**32**	**-**	**-**	**-**	**6,496**	**286**	**-**	**-**	**-**	**36**	**-**	**-**	**-**	**-**	**-**	**9**	**-**	**136**	**-**	**-**	**-**	**11**
37	**51**	**710**	**-**	**-**	**-**	**2,399**	**476**	**12**	**5**	**-**	**342**	**-**	**-**	**-**	**-**	**-**	**11**	**2**	**68**	**5**	**-**	**-**	**-**
38	24	18	-	-	-	1,062	388	7	-	-	100	-	-	-	-	11	15	5	408	-	-	-	-
39	56	-	0	1	1	674	229	35	5	-	-	-	61	-	-	-	4	967	-	-	-	-	-
40	127	33	-	16	2	835	-	577	1,260	-	46	-	-	-	-	-	-	1,548	60	21	-	-	-

Annex 3: Continued

July Set	Pacific cod	Lingcod	Pacific tomcod	Walleye pollock	Sablefish	Arrowtooth flounder	English sole	Rex sole	Dover sole	Rock sole	Pacific halibut	Sand sole	Flathead sole	Pacific sanddab	Starry flounder	Butter sole	Petrale sole	Spotted ratfish	Big skate	Spiny dogfish	Silvergray rockfish	Yellowtail rockfish	Bocaccio
1	5	-	11	14	-	94	45	35	3	0	21	-	45	0	-	-	-	2	-	1	-	-	-
2	10	-	3	14	0	96	10	73	107	-	10	-	129	-	-	-	-	-	14	-	-	-	-
3	1	-	-	1	2	51	2	84	183	-	-	-	16	-	-	-	-	0	-	-	-	1	-
4	5	-	-	18	1	74	1	40	81	-	6	-	8	-	-	-	-	0	-	1	-	4	-
5	15	14	0	15	23	208	22	64	3	-	5	-	19	-	-	-	-	-	-	0	-	6	-
6	-	5	-	12	1	137	5	69	16	0	-	-	14	-	-	-	-	-	-	-	-	110	-
7	35	1	2	125	15	116	39	64	8	-	23	-	-	-	-	-	-	0	-	2	-	11	-
8	44	-	1	136	26	144	26	73	1	-	5	-	10	-	-	-	2	-	-	3	-	2	-
9	15	-	0	105	3	146	6	29	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-
10	280	0	-	61	3	1,672	37	143	20	0	9	-	20	-	-	-	-	-	-	6	-	-	6
11	53	1	-	28	4	364	99	107	4	-	-	-	3	-	-	-	2	-	-	2	-	-	-
12	18	-	-	-	0	15	1	0	0	60	-	1	-	6	-	-	-	572	-	5	-	-	-
13	-	12	2	0	0	4	44	10	4	8	77	-	0	113	-	-	4	115	-	4	-	-	-
14	15	20	46	-	1	41	31	3	-	-	20	-	0	283	-	-	3	56	-	19	-	-	-
15	**-**	**19**	**0**	**-**	**-**	**10**	**-**	**-**	**-**	**17**	**5**	**-**	**-**	**2**	**-**	**-**	**4**	**7**	**5**	**1**	**-**	**-**	**59**
16	-	9	1	-	-	59	1	-	0	2	5	-	14	17	-	-	5	27	-	114	-	-	27
17	3	-	-	9	2	58	5	12	-	-	7	-	7	-	-	-	-	13	-	17	28	-	4
18	42	12	-	18	9	72	-	2	-	-	-	-	-	-	-	-	0	14	-	12	1,545	184	49
19	-	-	-	1	2	25	17	69	5	-	-	-	8	-	-	-	-	7	-	3	119	673	-
20	-	20	-	-	-	2	14	2	-	5	4	-	-	6	-	-	1	3	-	11	7	33	-
21	-	9	-	1	1	106	10	219	49	-	6	-	8	1	-	-	1	4	-	181	11	15	2
22	0	4	-	-	-	-	-	0	-	55	3	0	-	-	-	-	-	19	-	5	-	-	-
23	1	22	-	-	-	-	1	-	-	94	33	1	-	-	-	-	-	29	68	1	-	-	-
24	0	-	-	-	-	-	0	-	-	152	13	20	-	-	-	-	-	3	2	1	-	-	-
25	-	0	-	-	-	-	-	-	-	28	34	0	-	-	-	-	-	36	-	1	-	-	-
26	-	0	-	-	-	-	-	-	-	7	16	0	-	-	-	-	-	69	-	-	-	-	-
27	**526**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**153**	**16**	**19**	**-**	**-**	**-**	**-**	**-**	**24**	**-**	**-**	**-**	**-**	**-**
28	45	12	2	1	0	525	304	215	907	-	116	-	17	-	-	-	-	117	-	5	-	-	-
29	49	14	-	5	2	628	68	246	734	2	79	-	30	-	-	-	-	802	45	3	-	-	-
30	13	34	138	0	-	124	42	27	1	1	51	-	-	-	9	1	-	246	-	3	-	-	-
31	240	-	-	-	-	667	170	-	-	-	115	-	-	-	3	16	5	142	-	-	-	-	-
32	**156**	**120**	**-**	**0**	**-**	**427**	**81**	**2**	**3**	**1**	**87**	**-**	**-**	**-**	**-**	**-**	**1**	**66**	**27**	**3**	**-**	**-**	**33**
33	216	62	-	-	-	137	32	-	-	3	65	-	-	-	-	2	1	19	25	-	-	-	27
34	-	54	-	-	-	27	4	-	-	9	6	-	-	-	-	-	-	59	-	2	-	-	12
35	272	9	-	-	-	328	29	-	-	-	15	-	-	-	-	5	-	50	-	-	-	-	12
36	80	34	-	-	-	688	29	-	-	1	28	-	-	-	-	1	-	53	23	-	-	-	19
37	**0**	**270**	**-**	**-**	**-**	**2,908**	**66**	**-**	**-**	**7**	**300**	**-**	**-**	**0**	**6**	**-**	**-**	**42**	**29**	**-**	**-**	**-**	**-**
38	1	344	-	-	-	636	38	-	-	1	151	-	-	-	-	-	-	210	11	8	-	-	-
39	1	109	-	-	-	227	264	1	-	2	45	-	-	-	2	1	2	106	18	1	-	-	-
40	465	23	-	-	-	907	145	6	-	2	46	-	-	-	-	14	4	83	16	4	-	-	-

Annex 4: Cod Length frequency data, March. Sets selected by the vessel skipper are indicated in bold.

Set	7		11	12		13		14	15	20		21		22		23	25		26	28	30		31		32		33		34		35		36		37	38		39	Total
L (cm)	M	F	F	M	F	M	F	M	M	M	F	M	F	M	F	F	M	F	F	F	M	F	M	F	M	F	M	F	M	F	M	F	M	M	F	M	
21	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
22	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
23	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2
25	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	3
26	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	4
27	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-	7
28	-	1	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	1	-	-	-	-	-	-	8
29	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	3	-	-	-	-	-	-	6
30	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	-	5
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
33	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2
34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	3
42	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	4
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
46	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	-	1	-	-	-	-	5
47	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	1	-	-	6
48	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	3
49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	1	1	-	-	-	1	6
50	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	3
51	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	4
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	2	-	-	-	-	-	4
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	3
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	1	-	1	-	-	-	-	5
57	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	1	-	1	2	-	-	2	1	-	-	-	-	10
58	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	5
59	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	1	-	-	-	1	-	6
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	1	1	-	-	-	-	6
61	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	1	-	-	-	-	7
62	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	1	-	1	-	1	-	-	7
63	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	2	-	1	1	-	1	-	8
64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	-	1	-	-	1	-	5
65	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	1	-	-	-	-	7
66	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3
67	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	1	1	7
68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	1	-	-	-	6
69	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	1	1	1	1	-	-	1	-	1	-	10
70	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	5
71	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	6
72	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	5
73	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	4
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3
85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Grand Total	11	14	4	3	5	1	1	1	1	1	1	2	2	1	4	5	4	10	1	3	2	5	3	7	2	1	3	13	29	23	9	18	11	12	1	4	4	3	225

Annex 5: Cod length frequency data from April 2002. Sets selected by the vessel skipper are indicated in bold.

Set	2	3		6		8	9		11		12		13		14		15	17		18		20	21	22	23		24		25		26		27	
Length (cm)	F	M	F	M	F	M	M	F	**M**	**F**	M	F	M	F	M	F	F	M	F	M	F	F	F	F	M	F	M	F	M	F	M	F	M	F
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	1	3	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	-	2	5	-	5	-	-	-	-	-	-	-	1	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	5	-	6	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	13	-	11	9	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	1	-	6	10	-	9	13	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	1	-	-	-	-	-	-	7	4	-	5	12	4	5	-	-	-	-	-	-	-	-	-	-	-	-	1
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	12	-	13	8	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-	2	-	-	-	1	-	-	-	-	-	-	-	-	7	10	-	4	6	1	2	-	-	-	-	-	-	-	-	-	-	-	2	-
32	-	1	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	1	7	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3
33	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	1
35	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3
45	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	1	1	-	1
58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	3	4	-	-
59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-
60	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-
61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-
63	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	2	-	1
64	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	-	-	-	4	-	-
65	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	1
66	-	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	1	-
67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	1	-	-
68	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	1	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	2	-	-
72	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-
73	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	1	-	-
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-	-	-	-	-	-	-	-
76	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
77	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
83	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	1	-	-
Total	2	4	3	1	1	1	1	2	**2**	**11**	2	2	1	1	54	72	1	64	81	29	37	1	2	1	7	22	3	10	1	1	15	26	8	17

Annex 5: April 2002, Continued.

Set	28		29		30		31		32		33		34		36		37		38		39		40		Total
Length (cm)	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	6
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	14
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	16
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-	-	26
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	28
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	43
28	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	3	6	-	-	-	-	-	-	64
29	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	46
30	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	-	-	-	-	-	-	58
31	-	-	-	-	2	-	3	-	1	-	-	-	-	-	1	-	2	-	-	-	-	-	-	-	44
32	-	-	1	2	-	-	2	1	-	-	-	-	-	-	2	-	1	1	-	-	-	-	-	-	27
33	-	-	-	1	1	-	6	2	-	1	-	1	-	-	1	-	1	-	-	-	-	-	-	-	22
34	-	-	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
35	-	-	2	1	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
36	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
37	-	-	-	-	-	-	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
38	-	-	-	-	-	-	4	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
39	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
40	-	-	-	-	-	-	4	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
41	-	-	-	1	1	2	2	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	9
42	-	-	-	-	2	3	5	6	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	20
43	-	-	1	-	1	4	1	2	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	16
44	-	-	-	-	5	1	3	4	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	1	22
45	1	-	-	2	2	5	8	7	1	1	-	1	-	-	-	-	-	-	-	-	-	1	1	1	35
46	1	-	-	1	3	4	8	3	-	2	-	-	-	-	-	-	-	-	-	1	1	1	-	-	27
47	1	-	-	-	5	3	11	16	2	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	43
48	-	-	-	-	7	7	4	12	1	3	-	-	-	-	-	-	-	-	-	-	1	-	-	1	37
49	3	1	-	-	8	2	5	5	1	2	-	-	-	-	-	-	-	-	-	1	-	-	1	-	30
50	-	-	-	1	5	1	4	7	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	23
51	-	1	1	1	3	2	13	5	2	-	-	1	-	-	-	-	-	-	-	-	-	-	1	1	33
52	1	1	-	-	1	3	4	8	1	1	1	1	-	1	-	-	-	-	-	-	-	-	1	1	25
53	1	-	1	-	2	2	4	3	1	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	19
54	-	-	-	-	-	-	8	3	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	15
55	1	1	1	-	3	4	4	12	4	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-	37
56	2	-	1	1	2	4	9	7	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	31
57	-	1	-	-	-	3	1	2	4	1	-	1	1	-	-	-	-	-	-	-	-	1	-	-	21
58	1	1	-	-	3	-	5	1	-	3	-	1	1	-	1	-	-	-	1	-	-	-	-	-	28
59	3	1	1	-	1	3	2	10	2	2	-	1	2	1	-	-	-	-	-	1	-	1	-	-	36
60	-	1	-	-	1	1	5	1	3	1	3	-	-	-	1	1	-	-	-	1	-	-	-	-	25
61	-	-	-	1	1	4	3	6	-	3	1	-	-	-	-	1	-	-	-	-	-	-	-	-	21
62	-	-	-	-	1	1	2	-	-	-	-	1	-	-	1	1	-	-	-	-	-	-	1	-	11
63	1	2	-	-	-	4	-	4	-	2	-	1	1	1	-	-	-	-	-	-	-	-	-	-	23
64	-	-	-	-	-	1	9	4	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	31
65	-	1	-	-	1	1	1	2	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	17
66	1	1	1	-	-	2	3	4	1	3	-	-	1	2	-	-	-	-	-	-	-	-	-	-	26
67	1	-	-	-	-	-	-	4	3	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	13
68	-	1	1	-	1	-	3	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
69	-	-	-	-	1	-	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
70	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
72	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
73	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	7
74	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
75	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	6
76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
79	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Total	19	13	16	14	65	69	152	154	41	45	11	12	8	6	8	4	22	18	2	6	5	6	7	6	1200

Annex 6: Cod length frequency data from May, 2002. Sets selected by the vessel skipper are indicated in bold.

Set	2		5		6		7		8	10		11		12	**13**		14		16	17		18		19		20		21		22		23		24		25	
Length (cm)	M	F	M	F	M	F	M	F	F	M	F	M	F	F	**M**	**F**	M	F	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	3	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	4	1	-	-	2	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9	-	-	2	-	-	-	-	-
26	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	12	13	-	-	6	4	-	-	1	1
27	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	11	24	-	2	2	6	1	2	1	1
28	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	1	17	17	1	1	7	4	1	3	-	-
29	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	-	-	2	-	-	10	15	-	-	4	13	1	2	2	3
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	1	-	-	1	14	13	-	3	8	8	3	6	1	-
31	-	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	7	-	-	12	10	7	4	1	-
32	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	4	6	-	-	9	13	3	3	-	-
33	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	8	9	1	2	1	2
34	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	5	8	2	1	-	2
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	-	1	-	1
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3	3	-	2	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
44	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
46	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-
48	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	4	3	3	3	6	3	1	1	2	1	2	2	1	1	**3**	**1**	3	2	1	4	1	11	14	1	4	12	22	88	112	5	6	72	92	23	33	8	13

Annex 6: May 2002, Continued.

Set	26		27	28		29		30		31		32		33		34		35		36		37		38		39		40		41		Total
Length (cm)	M	F	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
26	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	42
27	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56
28	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	62
29	-	-	-	-	-	1	-	-	-	-	-	-	3	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	63
30	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	-	-	1	-	2	1	-	-	-	-	-	-	-	-	-	-	67
31	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	3	6	-	-	-	-	-	-	-	-	-	-	68
32	-	-	-	-	-	-	-	-	-	-	-	2	4	-	2	1	1	-	1	1	4	-	-	-	-	-	-	-	-	-	-	61
33	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	2	1	-	1	2	-	1	-	-	-	1	-	-	-	-	-	39
34	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	3	4	6	1	1	-	1	-	-	-	-	-	-	-	-	42
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	3	2	-	1	1	-	-	-	-	-	-	-	24
36	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	1	-	3	8	1	-	-	-	-	-	2	-	-	-	-	-	28
37	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	4	3	1	2	-	-	-	-	-	-	-	-	-	-	16
38	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	7
39	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5
40	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	5
41	-	-	-	-	1	-	-	-	-	1	-	-	1	-	-	-	-	1	3	-	-	1	2	-	1	-	-	-	-	-	-	11
42	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	1	5	3	-	-	1	1	1	-	-	-	-	-	-	-	16
43	-	-	-	-	-	-	-	1	-	1	-	2	1	-	-	2	2	4	1	-	-	-	1	-	-	1	-	1	-	-	-	22
44	-	-	-	-	-	-	-	1	-	1	-	-	3	-	-	3	2	7	2	-	-	3	4	-	-	-	-	-	-	-	-	31
45	-	-	-	-	-	-	-	-	-	3	1	-	7	-	-	2	6	3	2	-	-	1	2	-	-	-	-	-	-	-	-	28
46	-	-	-	-	-	-	-	1	3	-	4	-	2	-	-	1	2	13	8	-	-	3	5	-	-	-	-	-	-	-	1	47
47	-	-	-	-	-	-	-	1	1	3	1	2	4	-	-	6	1	15	7	1	-	2	3	-	1	1	-	-	-	1	-	55
48	-	-	-	-	-	-	-	1	1	6	4	-	4	-	-	1	3	14	17	-	-	4	5	-	-	1	1	1	-	-	-	65
49	-	-	-	-	-	-	-	-	1	1	2	6	5	-	1	-	5	10	11	-	-	3	4	-	-	-	2	-	-	-	-	51
50	-	-	-	-	-	-	-	-	2	4	4	3	2	1	-	7	4	17	9	-	-	8	5	-	-	-	1	-	-	-	-	69
51	-	-	-	-	-	-	-	1	-	4	1	1	1	-	-	4	6	6	6	-	-	7	3	-	1	-	-	-	1	-	-	42
52	-	-	-	-	-	-	-	-	1	3	3	5	5	-	-	2	6	1	4	-	-	5	4	-	1	-	-	-	-	-	-	40
53	-	-	-	-	-	-	-	-	2	3	1	3	3	-	-	4	4	4	4	-	-	3	1	-	-	-	-	-	-	-	-	32
54	-	-	-	1	1	-	-	-	-	-	3	9	2	-	-	6	5	5	3	-	-	2	4	-	1	-	-	-	1	-	-	44
55	-	-	-	-	-	-	-	-	-	4	2	2	2	-	-	3	2	2	6	-	-	5	1	-	-	-	-	-	-	-	-	29
56	-	-	-	-	1	-	-	1	-	3	2	6	1	-	-	4	2	1	5	-	-	5	4	1	-	-	-	-	-	-	-	38
57	-	-	-	-	-	-	-	-	-	3	3	7	2	-	-	5	2	2	1	-	-	2	4	-	1	-	-	-	-	-	-	32
58	-	-	-	-	-	-	-	1	1	3	1	1	3	1	-	4	6	4	-	-	-	6	6	-	-	-	-	-	-	-	-	39
59	-	-	-	-	1	-	-	1	2	3	3	3	3	-	1	5	3	2	4	-	-	9	3	-	-	-	-	-	2	-	-	46
60	-	-	-	1	1	-	-	-	-	2	3	9	3	-	2	9	8	3	1	-	-	4	8	-	1	1	-	-	-	-	-	56
61	-	-	-	-	-	-	-	1	1	8	2	8	3	-	-	1	4	-	1	-	-	5	6	-	1	-	-	-	-	-	1	44
62	-	-	-	1	-	-	-	1	1	5	4	9	5	-	-	5	5	1	2	-	-	7	4	-	-	-	-	-	-	-	-	52
63	-	-	-	1	-	-	-	2	-	6	8	3	6	2	-	5	9	-	-	-	-	5	6	1	-	-	-	-	-	-	-	56
64	-	-	-	-	-	-	-	-	-	5	6	7	5	-	-	8	5	-	1	-	-	2	5	-	-	-	-	-	-	-	-	45
65	-	-	-	-	-	-	-	1	-	3	3	3	4	-	-	4	4	-	-	-	-	2	5	-	-	-	1	-	-	-	-	32
66	-	-	-	-	-	1	-	-	2	4	8	3	4	-	1	2	5	2	-	-	-	3	3	-	1	-	-	-	-	-	-	40
67	-	-	-	-	-	-	-	-	-	6	4	2	6	-	-	3	4	1	-	-	-	3	-	-	-	-	-	-	-	1	-	32
68	-	-	-	-	-	-	-	-	-	1	7	3	2	-	-	5	1	1	2	-	-	1	2	-	-	-	-	-	-	-	1	29
69	-	1	-	-	-	-	-	-	-	2	10	4	6	-	-	1	-	1	1	-	-	1	2	-	-	-	-	-	-	-	-	31
70	1	-	-	-	1	-	-	-	-	2	5	3	1	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
71	-	1	1	-	-	-	-	-	-	3	2	1	2	-	-	1	3	-	1	-	-	-	1	-	-	-	-	-	-	-	-	18
72	-	-	-	-	2	-	-	-	-	-	1	1	1	-	-	-	-	2	-	-	-	1	1	-	-	-	-	-	-	-	-	11
73	-	-	-	-	1	-	-	-	1	-	-	1	1	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-	10
74	-	-	-	-	3	-	-	-	1	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	7
75	-	-	-	-	-	-	-	-	-	1	2	1	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
76	-	-	-	-	1	-	-	-	1	1	3	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
77	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	6
78	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	7
79	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
80	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
84	1	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	7
86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total	2	4	1	5	15	2	1	16	23	10	10	11	11	5	9	11	12	14	13	17	18	10	11	4	9	7	5	2	4	3	3	1891

Annex 7: Cod length frequency data from June 2002. Sets selected by the vessel skipper are indicated in bold.

Set	1	2		5		7		9		10		11	12		13		14	15		16		17		18	19		20		21		22		23	
Length cm)	M	M	F	M	F	M	F	M	F	M	F	M	M	F	M	F	M	M	F	M	F	M	F	M	M	F	M	F	M	F	M	F	M	F
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	1
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	2
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	-	-	1	3	4
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	1	-	5	5
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	4	4	1	1	12	4
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6	4	2	2	10	12
28	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	4	13	7	1	-	10	13
29	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	7	1	2	1	10	6
30	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	8	3	2	2	14	4
31	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6	8	-	-	7	5
32	-	-	-	1	-	-	2	-	1	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	2	-	3	1	-	-	-	3
33	-	1	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	3	3	-	-	1	1
34	-	-	-	-	-	1	2	-	-	1	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2	3	2	2	-	-	1
35	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	4	2	-	-	2	4
36	-	-	-	-	-	2	-	-	-	2	-	-	2	2	-	-	-	-	-	-	-	1	-	-	-	-	3	-	2	2	-	1	2	-
37	-	-	-	-	-	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-
38	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
39	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-
40	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
43	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
45	-	-	-	-	-	-	2	-	-	-	2	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	1	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-
47	1	-	-	-	-	-	2	-	-	-	2	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	4	-	-	-	4	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-
49	-	1	-	-	-	1	1	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	1	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
51	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
56	-	-	-	-	-	2	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	1	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
81	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	-	-	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
88	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

| | | |

88	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
90	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Total	86	81	4	7	6	6	7	13	9	18	51	47	3	4	2	1	19	20	97	109	**31**	**40**	**92**	**119**	**109**	**122**	**22**	**19**	6	8	20	18	18	31	1750

Annex 8: Cod length frequency data, July 2002. Sets selected by the vessel skipper are indicated in bold.

Set	1		2		3	4		5		7		8		9		10		11		12		14		17		18		22	23			24	**27**		28		29	
Length (cm)	M	F	M	F	M	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	U	M	F	U	U	**M**	**F**	M	F	M	F
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**-**	**-**	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**-**	**-**	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1	-	**-**	**-**	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	1	1	**-**	**-**	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**-**	**-**	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**1**	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**	**-**	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**	**1**	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**	**2**	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**	**7**	-	-	-	-
28	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	**6**	**6**	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	-	**6**	**6**	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	**5**	**13**	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	2	-	-	1	-	-	1	-	1	-	-	-	**12**	**8**	-	-	-	-
32	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	-	-	-	2	-	1	-	-	-	-	1	-	-	1	-	-	**10**	**10**	-	-	-	-
33	-	-	-	-	-	-	-	-	-	2	1	2	1	-	-	-	-	1	-	4	4	-	-	1	-	-	1	-	-	-	-	-	**11**	**11**	-	1	-	-
34	1	1	-	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	**18**	**9**	-	-	-	-
35	1	1	-	-	-	-	-	-	-	1	-	2	-	-	1	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	**13**	**9**	-	-	-	-
36	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	**8**	**6**	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	1	1	-	-	-	-	-	1	-	-	-	-	-	**4**	**7**	-	-	-	-
38	-	-	1	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-	**7**	**3**	1	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	**2**	**1**	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**	**1**	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	**-**	**2**	-	1	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	**-**	**1**	-	-	-	-
43	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
44	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-	-	-	-	**1**	**-**	-	-	-	-
45	1	-	-	-	-	1	-	-	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**	**-**	-	-	-	-
46	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	2	2	-	-	-	-	-	**2**	**-**	-	-	-	-
47	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	2	-	-	-	-	-	-	-	-	-	1	5	-	-	-	-	-	**3**	**4**	-	-	-	-
48	-	-	-	-	-	-	1	1	-	1	-	1	1	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	**2**	**4**	1	-	-	-
49	-	1	-	-	-	1	1	-	-	1	1	-	-	-	-	-	1	1	2	-	1	-	-	-	-	-	3	-	-	-	-	-	**4**	**4**	-	-	-	-
50	-	-	-	-	-	-	-	-	1	1	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	**1**	**5**	1	-	-	-
51	-	-	1	-	-	-	-	-	-	-	2	1	2	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**1**	1	-	1	-
52	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	**1**	**-**	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**1**	-	-	-	-
54	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**	**1**	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**	**1**	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	**1**	**-**	1	-	-	-
57	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	**-**	**-**	-	-	-	-
58	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**	**-**	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	**-**	**-**	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	**-**	**-**	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	1
62	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
63	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
64	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	2	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	**-**	**-**	-	-	-	1
66	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	**-**	**-**	-	-	-	2
67	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
68	-	-	-	-	-	-	-	1	-	-	1	1	1	-	-	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	1
71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-

Annex 8: Cod length frequency data, July 2002. Continued

Set	1		2		3	4		5		7		8		9		10		11		12		14		17		18		22	23			24	**27**		28		29	
Length (cm)	M	F	M	F	M	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	U	M	F	U	U	**M**	**F**	M	F	M	F
73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	1
75	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	1
76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	2	-	-
77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	1
78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	1	-	-
85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-
Total	4	4	3	1	1	2	2	6	4	14	16	20	18	4	5	24	51	9	11	17	18	3	6	2	2	13	24	8	1	1	2	1	**134**	**125**	5	12	1	8

Annex 8: Cod length frequency data, July 2002. Continued

Set	30		31		32		33		35		36		37	38	39		40		Total
Length (cm)	M	F	M	F	M	F	M	F	M	F	M	F	M	M	M	F	M	F	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	22
31	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	28
32	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
33	1	1	-	-	1	-	-	-	1	1	-	-	-	-	-	-	1	-	46
34	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	42
35	1	1	-	-	1	-	-	-	-	1	-	-	1	-	-	-	-	1	37
36	1	-	-	2	1	-	-	-	-	2	1	1	-	-	-	-	-	1	28
37	-	-	-	-	1	1	-	-	2	1	-	-	-	-	-	1	1	3	27
38	2	-	-	-	-	-	-	-	-	1	1	-	-	-	1	-	-	1	24
39	-	-	-	-	-	3	-	-	1	-	1	-	-	1	-	-	-	1	11
40	-	2	-	1	1	1	-	2	1	-	2	-	-	-	-	-	1	4	18
41	-	-	1	-	1	1	-	-	-	-	1	-	-	-	-	-	1	2	12
42	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	1	-	7
43	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	7
44	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2	-	10
45	1	-	-	2	2	-	1	-	4	-	-	-	-	-	-	-	2	3	23
46	-	-	-	3	1	3	-	1	1	2	1	-	-	-	-	-	2	6	30
47	-	-	1	3	1	2	2	1	2	-	-	-	-	-	-	-	7	6	42
48	-	1	1	3	-	2	3	5	3	3	-	-	-	-	-	-	10	9	55
49	-	1	7	6	2	4	5	4	2	-	-	2	-	-	-	-	14	15	83
50	-	2	6	8	2	4	4	5	6	8	3	3	-	-	-	-	11	22	98
51	-	-	3	7	3	1	3	3	4	2	1	4	-	-	-	-	6	10	58
52	-	-	6	2	2	6	2	7	5	7	2	2	-	-	-	-	9	6	62
53	-	-	4	7	2	4	3	7	10	2	1	1	-	-	-	-	1	10	56
54	-	-	1	5	1	4	4	5	3	6	1	2	-	-	-	-	6	5	47
55	1	-	3	-	3	5	2	6	3	3	1	-	-	-	-	-	2	4	38
56	-	-	-	2	2	1	4	1	2	3	-	2	-	-	-	-	3	2	29
57	-	-	-	1	-	3	2	2	3	2	-	5	-	-	-	-	2	3	26
58	-	-	-	-	2	-	5	-	2	-	1	2	-	-	-	-	4	2	23
59	-	-	2	2	1	-	3	1	-	-	-	-	-	-	-	-	2	4	20
60	-	-	5	3	-	3	2	4	2	2	-	-	-	-	-	-	-	2	27
61	-	-	1	1	1	-	-	1	1	1	-	1	-	-	-	-	1	2	18
62	-	-	2	3	-	2	2	3	4	3	-	-	-	-	-	-	1	1	25
63	-	-	3	2	-	-	-	3	1	1	-	-	-	-	-	-	1	1	15
64	-	-	1	-	1	1	-	1	-	7	-	1	-	-	-	-	1	3	23
65	-	-	3	-	-	-	-	-	3	-	-	3	-	-	-	-	1	-	18
66	-	-	-	4	2	2	1	3	2	-	-	-	-	-	-	-	1	-	23
67	-	-	2	1	-	1	2	2	3	3	-	-	-	-	-	-	-	-	17
68	-	-	1	2	-	1	-	1	-	2	-	1	-	-	-	-	-	-	18
69	-	-	-	-	-	-	1	2	2	-	-	-	-	-	-	-	-	1	13
70	-	-	-	1	1	1	-	1	1	-	-	-	-	-	-	-	1	-	12
71	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	1	9
72	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	1	-	7

Annex 8: Cod length frequency data, July 2002. Continued

Set	30		31		**32**		33		35		36		**37**	38	39		40		Total
Length (cm)	M	F	M	F	**M**	**F**	M	F	M	F	M	F	**M**	M	M	F	M	F	
73	-	-	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	4
74	-	-	-	-	**1**	-	-	1	-	-	-	-	-	-	-	-	-	-	8
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
76	-	-	-	1	-	**1**	-	-	-	1	-	-	-	-	-	-	-	-	7
77	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	6
78	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	5
79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
82	-	-	-	-	-	**1**	-	-	-	-	-	-	-	-	-	-	-	-	4
83	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3
84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total	10	10	54	75	**36**	**61**	53	75	74	71	18	31	**1**	1	1	1	97	134	1385